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Agricultural Journal.

Issued by the Agricultural Department.

EDITED BY J. CAMERON.

VOL. VI.—NO. 1.] OCTOBER, 1908. [5s. per annum.

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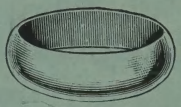

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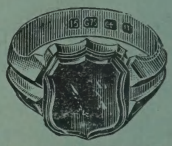

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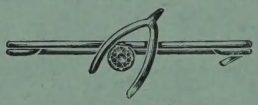

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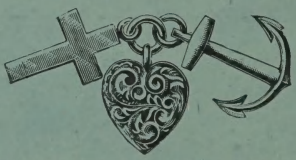

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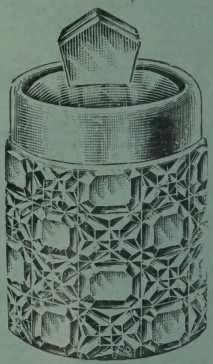

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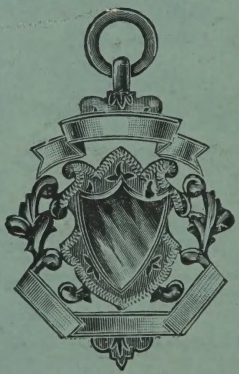

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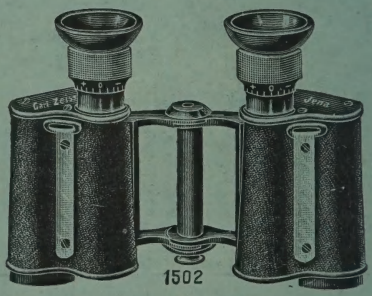

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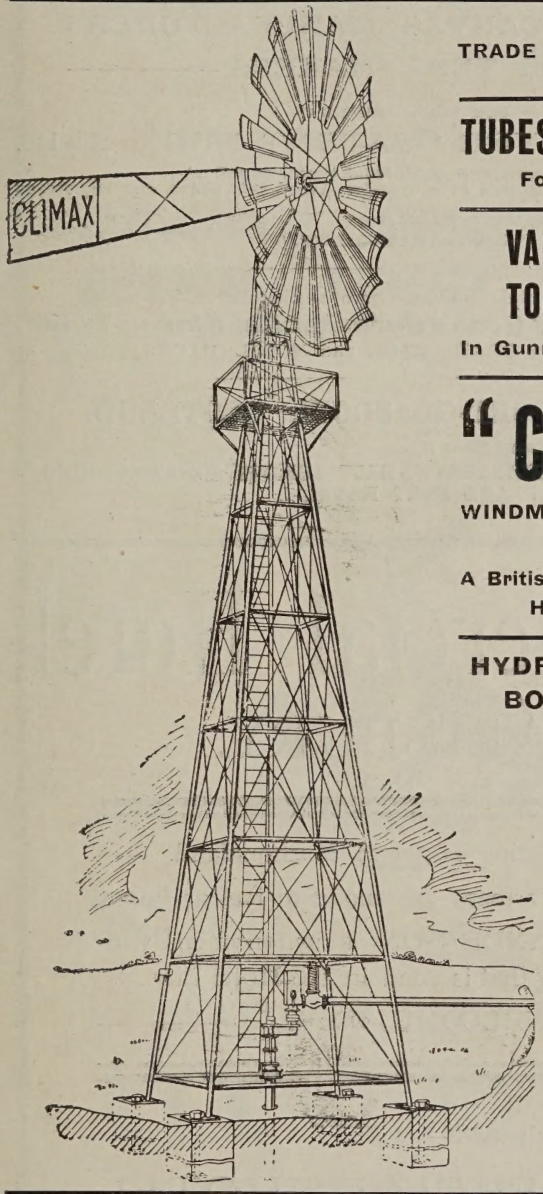

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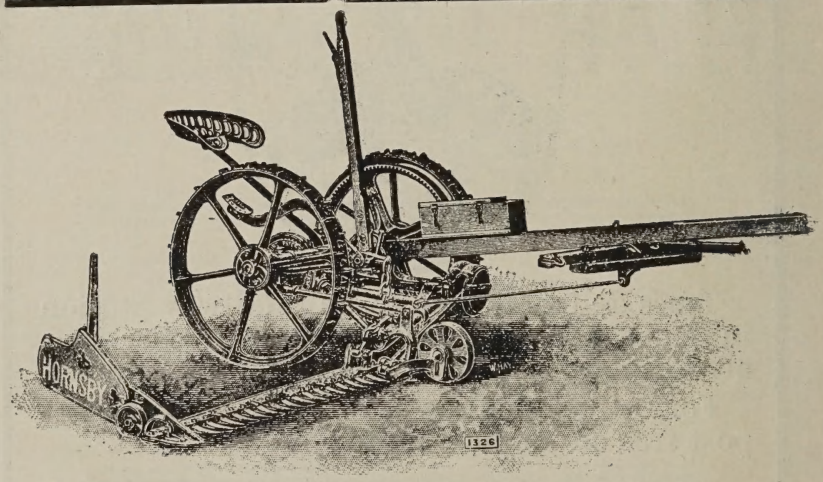

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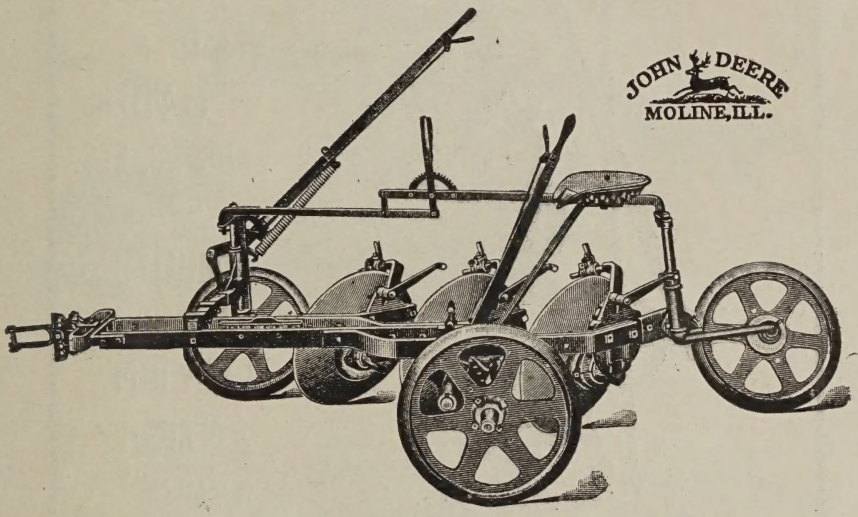

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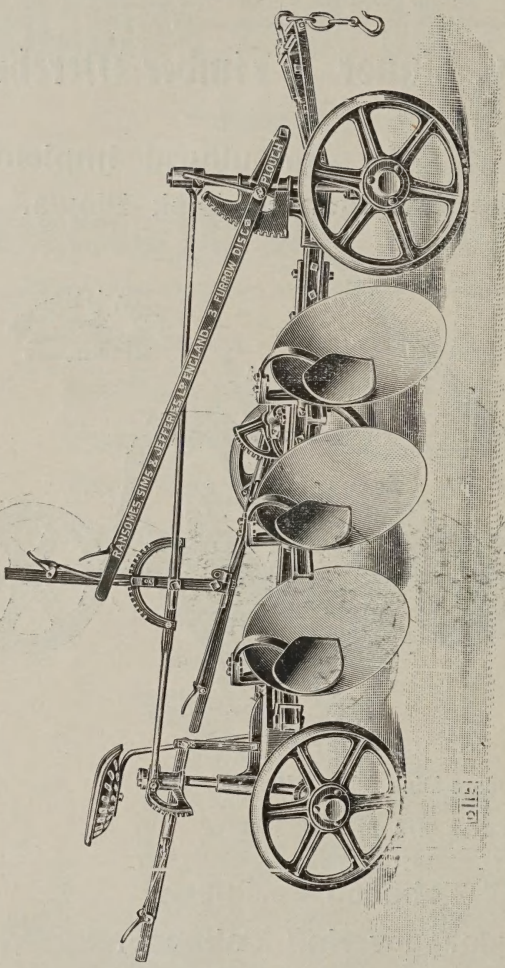

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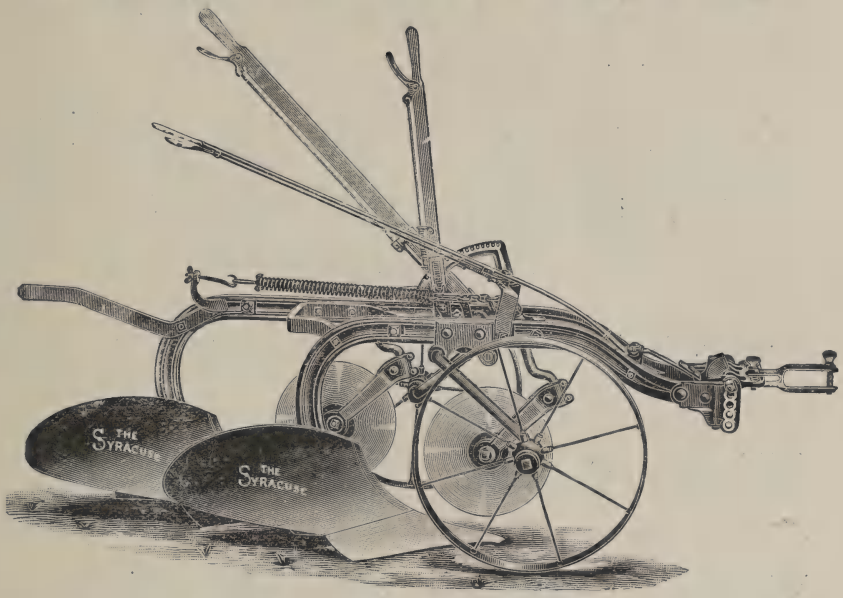

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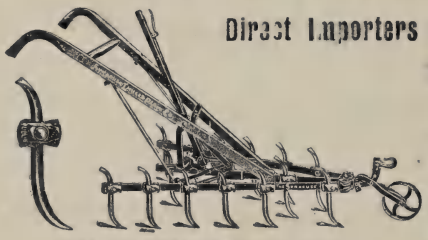

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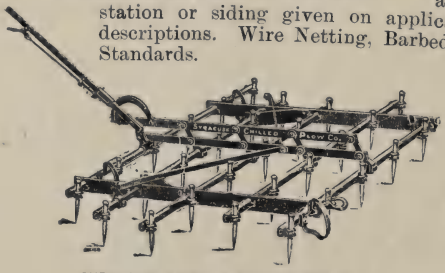

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THE RHODESIAN

AGRICULTURAL JOURNAL

Issued by the Agricultural Department.

EDITED BY J. CAMERON.

VOL. VI.—NO. 1.] OCTOBER, 1908. [5s. per annum.

Editorial.

The farming possibilities of Rhodesia are attracting more attention now than at any previous time in the history of the country.

Certain farming industries have been proved to such an extent that there is no longer any doubt as to the wisdom of employing labour and capital in their pursuit.

In former periods much capital was expended in the development of land which was more or less of a speculative nature. Certain things were tried according to the ideas of the investor, and perhaps had to be tried and tried again with new ideas and other investors before the present stage has been reached, when some distinction can be made between those which fail and those which succeed.

It must be admitted that among the farming industries that have been established, there is nothing new to Rhodesia. Grain, cattle and sheep, and tobacco are the industries that are indigenous to the country. The successful occupation of the white race rests not so much on the introduction of new and different industries as upon producing more and better grain, more and better cattle and sheep, more and better tobacco. It is true the white farmers are not confined to these industries, only up to the present nothing has been established as a speciality that would invite a class of men to depend upon it for a living.

All the other branches may be regarded as valuable adjuncts, and they are probably in Rhodesia more numerous than in most other agricultural countries.

But grain, stock and tobacco are the mainstay, and it is now when the new season is opening that farmers have it in their power to put in force the changes in procedure that are called for, in order to invite success where there had been failure in the past.

It must be observed that improvements proceed along certain lines. No drastic changes are required, but generally it is the following up of the methods and practice that have already been seen to succeed.

In stock raising it is at this season ascertained what the difficulties really amount to that have to be met and overcome in bringing herds through the dry season in good condition, and farmers have it in their power with the new season in front of them in taking and carrying out those measures that are best calculated to meet and bridge over the natural deficiencies.

The tobacco industry makes great forward movement from year to year; the experience gained one year through experimental trial is made use of next year for working on a larger scale.

There are perhaps certain lines in the tobacco industry that have not yet been taken advantage of to the extent that might be possible.

While the high-class tobaccos are unrivalled, and no effort spared in keeping up the high level of excellence they have reached, yet the curious fact exists that the great bulk of pipe tobacco smoked in Rhodesia is imported from other S.A. Colonies, chiefly the Transvaal.

We do not infer that the tobacco imported from the other Colonies is any better than the same class grown in Rhodesia, only these Colonies grow and manufacture a tobacco with the view of supplying the existing South African demand for a cheap smoking tobacco.

But in the tobacco industry of Rhodesia this branch of the business is almost neglected, with the consequence that farmers lose the local market naturally accruing to them.

It must be noted that the class of pipe tobacco which is chiefly smoked in Rhodesia, and which creates the greatest volume of trade in the article, is a mixture retailed at 3s. to 4s. per lb.

We think that, without in any way interfering with the high class tobaccos grown and manufactured in Rhodesia for export trade, there might also be a pipe mixture produced that would compete with the article now imported from the Transvaal and other Colonies.

The scale insect infesting the trees on Salisbury Kopje has lately had attention drawn to it on account of its threatening to spread.

Since this particular scale was unknown to entomologists, there was no information what measures were best to adopt in dealing with it.

In order that accurate observation should be made on its manifestation, the services of Mr. Chas. P. Lounsbury, Cape Government Entomologist, were obtained through the Cape Government, and investigations were made by him concerning it on the spot.

Mr. Lounsbury has submitted his report to the Secretary for Agriculture, and which is published in the present issue of the "Journal."

It has been ascertained that the presence of this scale (to which Mr. Lounsbury has given the name "Mammoth" scale) is not confined to the restricted area of the small kopje where all the Msasa trees are loaded with them, but that it has already extended to a distance of two or three miles, but only in very small numbers.

One of the points of most importance in dealing with it is the determination of the source from whence it came.

In order to help this inquiry, an illustration of the scale (natural size) is given in this issue, and Native Commissioners in the outlying districts and parties living throughout the country are invited to send specimens to this Department should they at any time happen to observe them anywhere on any of the trees on the veld.

Mr. Lounsbury attaches great weight in having it determined whether or not this mammoth scale is indigenous to the country, or whether it has been imported from some other country, and finding it anywhere in Rhodesia other than the Salisbury Kopje would give the necessary clue.

Prof. Wallace, Professor of Agriculture in the University of Edinburgh, has lately made a tour throughout Rhodesia, with the view of making observations on the agriculture of the country.

We are not aware that Rhodesia has ever been honoured before with the presence of an agriculturist of such eminence having for his express purpose making an investigation of the agricultural resources and capabilities of the country.

In visiting the various parts of the country, the Professor made it his chief endeavour to acquire information from those engaged in the business of farming—gaining what he wanted to know at first hand.

We have little doubt the report which will be given by Professor Wallace will be an interesting document, and will be received with due respect and attention by Rhodesia and its farmers.

Some Notes on Cattle Breeding in Rhodesia.

By A. R. Morkel.

A few years ago (1901) before the scourge of African Coast Fever swept over this country, I collected a few notes on cattle breeding which seem as applicable to the question to-day as they were then.

I will commence with the following paragraph from an article by "Bruni" in the "Australasian":—

"What the Americans describe as 'graded' cattle must not be confounded with cross-bred. The term 'grading' means bringing up an inferior mongrel herd to a high degree of usefulness by the continued use of pure-bred bulls of that breed which the herd-owners consider to be the best adapted to the conditions of life in the locality. A very large proportion of Australian herds belong to this category, and they present all degrees of improvement, from the original mongrel stock to the herds that have such an infinitesimal amount of base blood that it is scarcely worth noticing.

"In appearance these high grades would be taken, even by experts, for pure animals, but though very small, the taint is there, and they cannot be depended upon as stud stock.

"For the general herd these high grade cattle are extremely valuable. The small infusion of mongrel blood in their pedigree seems often to give them a hardihood that the pure breed does not possess.

"Of the two systems of breeding, the best for the average Australian cattle-breeder is, I think, grading up. From what I have seen of the two systems of breeding as practised in Australia, it requires the exhibition of much greater skill on the part of the husbandman to maintain a cross-bred flock or herd at a high degree of excellence than to grade up to something near that standard by the use of pure sires of one breed.

"As in cross-breeding, the success of grading-up depends mainly upon the selection of the best breed calculated to give the most profit in the locality. In estimating this profit a great mistake is often made. The money realised by individuals is only one leading factor. The real test is the return per acre per annum carried on over a number of years including periods of drought as well as periods of abundance."

With reference to the above, I should like to state that since 1901 most cattle-breeders in Rhodesia have proved that the continued use of pure-bred bulls of almost any imported breeds is a mistake. Any attempt to breed animals above the quality of the veld is sure to end in disaster. This is a fact well known throughout South Africa.

The progeny of animals too well bred for the conditions of this climate are mostly weedy, and they become smaller and more weedy every generation while in the process of adapting themselves to the climate and veld.

If the animals were well fed and stalled in the winter even the best breeds would no doubt produce very fine specimens, but these remarks are not meant to apply to cattle raised in this way, but to the ordinary farmers' stock which constitute the bulk of the cattle raised in this country.

As to the amount of good blood which may be safely introduced, this is a question which each herd-owner should decide for himself, as it depends on a close observation of his veld and how his cattle thrive on it.

The Mashona, Angoni, Matabele, and other northern cattle have some useful qualities, chief of which are their extreme hardihood and ability to rustle for a living, and also great length of life.

Against these may be set their slowness in maturing, their rather light build, and preponderance of beef upon parts producing the lower priced cuts.

For generations the above cattle have lived in this climate, and we have in them a first class foundation to grade up from. They are far from ideal cattle, but serve the one useful purpose of infusing their hardihood into any progeny they may have from the better imported breeds.

Then comes the important question of what breed it is best to select sires for improving the general mongrel herd of this country.

Personally I am in favour of two breeds, viz., the Shorthorn and Devon. Of the Shorthorn I am, however, inclined to the opinion that we would not be able to grade up so high as with a Devon. There is a "fineness" about a Shorthorn's progeny which may be well enough for the first cross, but disaster would probably follow were the continual use of pure-bred bulls maintained.

To keep a fair standard of milking and beef-producing qualities on very good veld may be possible with the Shorthorn, but it seems a very easy matter to thus grade up a herd above the average quality of Rhodesian veld, when failure in one particular season may result in disaster to the herd.

On the other hand, "the Devon is a beast which does well in hilly, poor country, and is therefore hardy; he is also notedly good as a trek ox, and he makes first-rate beef. The milk of Devons has a high reputation for richness. The quality of Devon butter stands high—many hold it cannot be beaten. Devon cows are excellent calf producers. Given fair treatment, a cow will calve every year, and that is a good deal more than can be said of South African cows in general."

The above is the opinion of a noted Natal Devon-breeder, and since 1901 I have been able to form my own conclusions that it is a perfectly correct one.

It seems that by using a more hardy breed of animal to grade up our mongrel herd, we would be able to infuse a much larger quantity of good blood into it than would be

possible were we to use good blood from a more delicate breed. Therefore my preference is for the Devon.

There are many other breeds of cattle that may do quite as well as either the Shorthorn or Devon, notably Hereford and Aberdeen Angus. The results that have accrued from the use of sires from these different breeds upon our common cattle have not been widely published.

We are still very much in the experimental stage, and it remains to be proved which breed will stamp the greatest amount of excellence on the progeny of the mongrel herd, and therefore we do not know for certain from which breed we should select sires for the grading up system.

The Cattle Industry in Rhodesia.

(*Continued.*)

By J. Cameron.

In taking a general view of the way in which the land in Rhodesia is being taken up and occupied, it may be perceived that for cattle raising purposes there are two main divisions—Ranching and Mixed Husbandry.

RANCHING.

The term "Ranching" is used to denote the system whereby the natural grazing resources of the country only are made use of in maintaining a herd of cattle. Ranching means large areas and large herds. Thirty thousand acres may be taken as the smallest area compatible with ranching, while the number of stock is only limited to what can be carried when grazing is at its worst.

An estimate of what number of stock a ranch of 30,000 acres will maintain can only be an estimate, but from the experience already acquired, taking one season with another, from 700 to 1,000 head is about the number, or thirty to forty acres per head.

During the best of the grass season, from December till April, three or four acres will provide abundance per head, so that there is no comparison between what the veld can do at its best and at its worst.

Apart from the breed or class of stock best fitted to meet the conditions, the economic question arises as to how "ranching" should be carried on in order to get the best returns from the veld. In starting, the ranchman must have in view the selling of his annual drafts—what class he intends to raise for marketing.

There must be some design infused into the industry which will make its impress on a herd, make it fittingly adapted to produce a certain character of animals.

Thus if trek oxen be the object, selection should be pursued in the direction of size and hardihood, and no other qualities need receive much consideration. Native cows, mated to a bull that can transmit the desired character to his progeny whatever be his lineage, such cows and their selected progeny are admirably suited for making the most of the veld towards the production of trek oxen.

The Africander breed taken by itself is unmatched for trek purposes, and also for hardihood in withstanding the rigours of the veld; they have reached such perfection in these respects that no improvement need be looked for by crossing with any other breed.

As far as the veld is concerned, the same may be said in regard to native cattle, increased size only being an advantage to farmers. Crossing native cows with Africander bulls has been resorted to in many instances with the view of securing this increased size in the progeny.

It is, however, far from being established that the method has been a success. Several of the largest breeders in Matabeleland, after ten years' experience, pronounce that mating native cows with Africander bulls is a failure—that the subsequent breeding qualities of such crossed progeny is lamentably deficient.

Every other pure breed, Friesland, Shorthorn, Devon, Hereford, Aberdeen Angus, gives a good cross at once with native cows, the progeny carrying forward the good qualities, instead of coming under "reversion," as with the Africander.

But ranching is not confined to the production of trek oxen. It is essentially established for breeding purposes —for producing animals that will sell. For beef purposes, however, an altogether different type of animal must be forthcoming than for trek, and another system adopted in order to furnish it.

Photo by] [*R. J. Laidlaw.*

Native (Angoni) Cow and Crossed Calf.

Photo by] [*R. J. Laidlaw.*

Native (Angoni) Cow and Crossed Calf.

For beef, quality and quickness of growth are essential, towards gaining which the attention of the ranchman will be directed in making his selections.

It has not yet been manifested how far "grading up" can be followed up in pursuing beef-producing qualities starting from a herd of native cows. This much is evident, that the first cross between a native cow and any pure British breed goes a long way towards fulfilling ideas of a beef animal. Thus the first step may be taken not only with safety, but it carries with it great significance in the policy which it enables a ranchman to pursue. Cows may be selected having the desired character of hardiness —either native or the crossed progeny. By using only pure-bred bulls the class of young stock obtained will command a price for being used for beef purposes whether they are matured on the ranch or not. The ranchman's object will be to keep as many as possible of that class which he is assured will carry themselves through, and that is cows. The young stock being better bred and more delicate will have to be disposed of as early as possible.

The whole stock will be breeding cows, and their progeny up to 18 months or so old, instead of a large proportion being kept on for maturing, while being at the same time a class for which the ranching system is unfitted.

Even with the foregoing system, and with the class of animals, it will be found that care and forethought will have to be exercised in getting the cows to calve down at the proper time, and also that the calves on being weaned should be segregated by themselves and fed with hay over the worst period of the dry season. If well brought through and grazed the next season until about May, they will command a ready sale to those who are going in for keeping cattle by methods other than ranching, but who at the same time must have animals of this particular class in order to suit their purpose.

MIXED HUSBANDRY.

Looking at the matter broadly, it is "Mixed Husbandry" and not "Ranching" that the land in Rhodesia is being laid out for. A six thousand or a three thousand acre farm in Rhodesia is not a "Ranch," neither can it be insisted that a system of cattle keeping which may be

pursued profitably on a ranch must at the same time be the only one to adopt and follow on the restricted area of a farm.

There are not more than half a score of ranches in Rhodesia, while there are nearly a thousand farms where mixed husbandry is carried on. The importance of the cattle industry of the future rests on the farms. The methods which are devised for maintaining a larger and better stock on a farm are improvements which imply a great advance on the ranching system.

The two systems are far from being antagonistic. Rather they are mutually supporting, and will become more and more so as the cattle industry advances.

They will each tend specialising a certain branch. Taken generally, the ranchman will be a breeder, while the farmer will be a feeder of cattle.

But the farmer must also have a design. He must specialise in order to make the most profitable use of the feed that his farm grows.

Herein "breed" is of the highest importance. The gross number of cattle that can be kept on a farm is not the chief end to be attained, but it is the number and value that can be disposed of annually that is the test of success.

If it is dairying that the farm is devoted to, it is not the number of cows that are kept, but the quantity of dairy produce sold against outlay, that determines profit.

BREEDING FOR BEEF.

Breeding for beef is different from breeding for dairying, and whichever is adopted the other had better be left subordinated.

There are breeds of cattle and strains in every breed that are good milkers as well as good beef producers, but this does not imply that the cows can be utilised for the dual purpose at one and the same time.

If substantial annual returns are to be looked for, either one or the other must be specialised. Attempting too much spoils both.

It may be assumed that nearly every farmer starts with the same class of stock—the native or the mongrel class of cows bred from them—which are indeed the only ones

generally obtainable. But this class of cows, both native and nondescript, are very susceptible of being impressed by a pure bred bull, so that the progeny follow the type of the sire. The original breed is entirely broken up. A new character is given even to the first cross.

In choosing which of the different breeds—Shorthorn, Aberdeen Angus, Devon, Hereford, Friesland, is best suited for the peculiar circumstances of Rhodesia, it is well to bear in mind that the particular breed is not the point of highest importance.

The essential thing to consider is what the natural capabilities of the farm are as regards easy grazing ground and the quality of the grass. It must be taken into consideration what area or what quantity of hay is available for mowing. Unless ample provision is made for winter feeding neither of the foregoing breeds will prove satisfactory further than the first cross. The stock-breeder of Rhodesia is the mowing machine.

The breed of cattle that a farm will carry is not to be gauged in terms of what the same area would do as a ranch.

It is true that a type of animal is being sought for, by breeding, that will possess in a certain degree the "hardihood" and the "rustling" characteristics of natives and africanders, while at the same time the quick growing and other desirable qualities of an improved breed will have been imposed.

In regard to this it may be observed that "hardihood" and "rustling" are qualities that can be done without to a remarkable extent. On a farm there is no necessity whatever that the hardihood or rustling capabilities of the stock should be put to the severe test that is almost inseparable from a ranch.

Indeed, "rustling" on a six thousand acre farm is out of the question. Square miles instead of acres are necessary at a certain period of the year if animals are expected to "rustle" for a living, and only natives and Africanders are built to foot the journeyings.

There is nothing in the Rhodesian climate that demands "hardihood" apart from constitutional vigour, and when winter keep is provided no extra "rustling" is called for during any part of the year.

By using pure bred bulls, the grading up of the stock on a farm may be carried forward indefinitely, the only limitations governing the success of the herd being the quality of grass and the provision made for overcoming the difficulties incident to the dry season.

GRADING UP A BREED.

In grading up a particular breed, much consideration must be given to the nature of the grass on a farm. The rock formation from which a soil is derived has the greatest influence on the quality of the grass—whether it possesses bone-forming nourishment sufficiently to meet the requirements of a large boned and quick growing breed.

The best grazing lands exist on rock formations containing lime. If lime is deficient in the soil then phosphate of lime will be deficient in the natural grasses growing thereon.

Lime, although existing in vast quantities in Rhodesia, is very unevenly distributed. Hence on veld which is very poor in lime, the introduction of cattle which are so much larger than those which are indigenous do not always give the satisfactory results that are hoped for.

Cattle or other animals that are accustomed to roaming over a large tract of country often attain a large size in Rhodesia, since what they do not get in one place they get in another. Cattle, however, that are confined within the space of a farm have no such opportunity. They must exist on the farm, whether it suits them or not, and if it does not suit them they will degenerate.

The very fact of grazing, however, improves the natural grasses on the veld, and much can be done in assisting young stock by supplying any deficiency of phosphates by giving them crushed bones to eat, and indirectly by liming portions of the veld for grazing. Water from wells, instead of river water and stagnant pools, is also advantageous.

The relative merits of the different British breeds for usefulness under Rhodesian conditions does not depend so much on quick growth or size as upon the constitutional aptitude to undergo the slight modifications or alterations which are necessary in making them fitted for the surroundings.

Photo by] [*H. C Thwaits*

Group of Dairy Cows belonging to C. C. Macarthur.

Photo by] [*R. J. Laidlaw.*

Mashona Cow and Calf, after Friesland Bull.

Robustness of constitution and sprightly vigour, together with prepotency, are qualities that every introduced breed must have if it is to succeed in establishing itself in Rhodesia.

Although it is not yet settled, and probably never will be, which is the best breed for Rhodesia, yet this much can be said already, that not one of all the foregoing mentioned breeds has been a failure. Indeed it most probably will be asserted by the different owners the one he himself possesses is the best.

Of the two provinces, Matabeleland has the finer quality of grass, and hence will support a very superior breed of cattle. The grazing period is however shorter, and more winter feeding will be necessary.

Mashonaland possesses a coarser grass, but it is eatable longer in the season, while so many vleis afford grazing a month or two earlier than Matabeleland.

Bone-forming material is more deficient in Mashonaland than in Matabeleland, and hence more liming will be required.

In both provinces the poverty of the veld during the winter months does not arise from the grass all being eaten off, neither is it due to burning. What makes the veld unsuitable for stock after June is that the grass becomes indigestible—it is in reality no better than wood shavings, and the instincts of cattle, for their own preservation, prohibit them from touching it. The same grass if cut and made into hay at the proper time, is quite nourishing and readily eaten by cattle and all other stock.

Silage Stacking.

(Extract from "Mark Lane Express," 3rd September 1894.")

A heavy man was kept constantly treading round the outside of the stack as it was being built up, and this is all that was done. The inside of the stack is better untrodden, as heating takes place more rapidly when the

grass lays hollower. The man who trod round the outside carried a bucket with loose salt in it, which he sprinkled about on the small patch salted for about 18 inches in width from the outside.

You are probably aware that you can make either "sweet" or "sour" silage, just as you please? If you desire the former, you must not hurry your stack up too soon, but build up a portion, say 5 or 6 feet, and then let it get just as hot as you like. For "sweet" silage, the temperature must be over 122 degrees at least. Anywhere from 122 to 160 degrees (or even more) won't hurt with green, damp grass, which you cannot fire if you try to. When the first portion of the stack has thus heated (or, in other words, "cooked") build up another portion. The weight of this second portion will so compress the first portion stacked as to exclude the air, arrest fermentation, and stop over-heating, just on the same principle as your putting your foot on a burning substance on the ground presses out the fire and heat. You cannot possibly get combustion, or burning, to go on if the air is excluded or pressed out. If you build up a large mass of green grass rapidly, you so overweight the lower portion of the mass as to prevent air getting into it, and, as a certain consequence, you have unfermented "sour" silage, which has a smell often far worse than a stale tan pit, and is the abomination of everyone who has to handle it. This makes the hands and clothes of those employed in its use a nuisance everywhere, especially in the dwelling house of the farmer or the cottage of the labourer. If farmers would only study for themselves how to secure the best results, they would not throw up the system in disgust just because they had made a blunder through sheer ignorance in a first experiment, or had heard of someone else who had.

You say you have begun a stack 7 yards in diameter for grass calculated at 150 tons. I hope you have a good elevator to get the grass up with, as the stack will get very high. I should have preferred 9 yards diameter at least. Five tons of green grass makes one ton of dry hay, or from three to four tons of silage, and well-made silage should weigh from 40 lbs. to 56 lbs. per cubic foot.

Growing Wheat.

In a letter addressed to the Agricultural Department, Mr. Heron, Eagle's Nest, Headlands, writes:—

If the Department is issuing instructions as to any particular way in which it is desirable this seed should be dealt with I will do my best to follow them.

Suggestions on the following points would be useful:—

(1) Site, high or low, dry or damp?
(2) Time to sow?
(3) Sow in drills or broadcast?
(4) Use kraal manure or none?
(5) Should seed be treated chemically or not?
(6) Aspect, north or south?
(7) Any other instructions advisable?

Will answers appear in Journal?

The reply sent to Mr. Heron is herewith given for general information to intending wheat-growers.

(1) *Site—high or low, dry or damp.*

The situation of a field for growing wheat is not wholly determined by height above the level of the surrounding country, neither by being in a valley or depression below that level. The guiding principle of selection is that the land possess a certain closeness of texture without being too retentive, have plenty of depth and evenness for root expansion and for downward and upward movement of water.

A light sandy or gravelly soil is unsuitable, since it is too susceptible for being affected with variable weather conditions, besides being nearly always too poor.

A stiff clay soil is unsuitable because it becomes baked and hard during a period of drought. Thus medium soil is best—that which is capable of absorbing a large amount of moisture without becoming wet and plastic, and which does not cake and become too hard on drying.

Although the situation has often a great deal to do with the formation of a soil possessing the requisite conditions, yet it often happens that suitable land is found on high ground, even on the top of kopjes, while valley bottoms are quite good provided the subsoil is sufficiently open and porous.

Land must be sufficiently dry that at no time during the growing period of the crop will it remain waterlogged.

Whether a soil is "wet" or "dry" is in most cases well ascertained after a period of heavy rainfall.

An open porous subsoil will always dry the land provided there is no ooze coming from below keeping the subsoil wet.

An ooze of this kind is not infrequent, and it nearly always happens that the land is too wet for getting the seed bed prepared until too late in the season, and only a winter crop can be grown.

A soil containing a good deal of sand is to be preferred for early sowing (October—December) on account of the more favourable way it can dispose of any excess of rain during the early part of the summer season.

For later sowing (January—February) heavier land may be used—that is land containing more silt and clay but which has shown to continue firm and dry enough for cultivation, after receiving a large amount of rain.

It may be accepted generally that where a good crop of mealies has been reaped for two successive seasons the same land will yield a good crop of wheat.

Red soil will be more readily found suitable than black vlei soil. When the land contains too much vegetable matter it will happen that the wheat will grow too much to straw, while the ears will be empty.

(2) *Time to Sow.*

No specific date can be mentioned as fixing a certain and only time when wheat can be sown with good results.

Generally speaking, when the land is "dry" and there is little danger of its remaining waterlogged, even under heavy rain, wheat can be sown early—any time from October till December.

When however the land under heavy rain may be liable to retain water, and become more or less "wet," then later sowing is advisable. It is moreover this class of soil that on the whole is most suitable for wheat, and probably after experience it will be found that from the middle of December to the middle of January will be the best season for sowing.

Matabeleland is the better suited for early sowing, having drier land and less rainfall, while Mashonaland having more wet land and heavier rains will induce later sowing.

(3) *Sow in drills or broadcast.*

In so far as the yield is concerned, there is little advantage gained either way. Less seed per acre is required by drilling. There is also an advantage in drilling that a certain amount of cultivation and weeding can be accomplished without destroying many plants.

Thus, if a growth of weeds is apprehended, drilling should be resorted to, but if the land is clean and in a good state of cultivation, broadcast sowing is quite as good. About 60 lbs. per acre is required for drilling, and about 80 lbs. broadcast, but the return per acre is in favour of broadcast sowing.

(4) *Use kraal manure or none.*

If the land is inclined to be poor, or if it has borne a good many crops of mealies without ever having received any manure, there is no doubt a better crop of wheat will be obtained by the use of kraal manure.

There is some objection to kraal manure on account of the weeds it introduces when used fresh. A way of dealing with it in order to overcome this, is to apply it to the land direct from the kraals—spreading it over the surface as evenly as possible.

It should be put thus on the land before the rains commence. With the first rains all the weeds will spring up directly, and when they are all well started growing, the land should be then ploughed when everything that has germinated will be buried under and killed. This system is specially applicable for crops that are to be sown in December or in January, since the manure can be applied at any time during the dry season and allowed to lie, and the weeds all come up until the time arrives for preparing the seed bed.

(5) *Should seed be treated chemically or not.*

There is no necessity to treat seed wheat chemically unless smut or other fungoid diseases are apprehended. But since chemical treatment can be easily applied, and it does not injure the vitality of the seed in any way, it is a means of preventing such diseases being introduced.

For the purpose, Formalin has given the most satisfactory results. Formalin at 40 per cent. strength (the

usual commercial article) is used at the rate of one pint to 30 gallons of water. Sprinkle the formalin solution over the seed with a watering-can, and shovel over until the surface of each grain is thoroughly moistened. Then shovel into a heap and cover with wet sacks, letting it remain so for two hours. Then uncover and spread the grain out to dry, turning it over so frequently that it becomes sufficiently dry to prevent germination. Put it into a clean sack, or one that has been treated in the solution, when it will keep until it is required for sowing. For small quantities, an ounce bottle of formalin to three gallons of water is the proportion.

(6) *Aspect—North or South.*

Other conditions being equal, an aspect towards the east is not to be favoured. The more constant winds coming from the east, the ground that is exposed in that direction suffers from more speedy evaporation than ground sloping towards the west.

Again, ground sloping towards the south—away from the sun, is not affected by the sun's heat quite to the same extent as ground sloping to the north—towards the sun. Thus a more even temperature will pervade the soil having a southern aspect, modifying excessive evaporation.

On the whole, ground sloping towards the west and south has a better aspect than ground which slopes north and east, but this is far from applying to every locality.

(7) *Any other instructions advisable.*

Wheat requires a firm seed bed. The field taken is supposed to have been ploughed and harrowed some time during the winter months. If not ploughed before, it should be ploughed as soon as possible after the first rain. In preparing the seed bed the land should be ploughed to the depth of about six inches. If the seed is to be drilled in, the ground should be harrowed two or three times, making a smooth even surface.

After the seed is sown, the land should be rolled with a heavy roller, and afterwards a light harrow should be passed over, breaking the surface and forming a mulch, controlling evaporation.

Mechanical pressure or soil packing is better for conserving and utilising soil moisture than the consolidation that follows after the dripping and pelting of rain. When

mechanically pressed the soil resists further compression by atmospheric agencies, and thus remains in the form and condition given to it, and which is calculated as favouring root development and the conservation of moisture.

For sowing broadcast the treatment is the same, only the principal harrowing should be given after and not before the seed is sown. The land should be rolled and lightly harrowed afterwards, but no cultivation can be pursued while the crop is growing.

The cultivation of growing wheat is profitable only when there occurs a period of drought shortly after it comes up.

The weather conditions should be taken advantage of within the period from November till February, as far as the varieties of soil will admit. Cloudy weather and a damp soil are the most favourable conditions for speedy germination. The ground must not be too wet for being worked upon, nor is it judicious to sow when the ground is very dry, since if the seed only germinate, it is liable to die out before rain may come. Wheat requires about sixteen weeks to come to maturity.

The following letter, also relating to wheat growing, has been received by the Department from Messrs. Anderson and Robertson, Devon Farm, Pemba, N.W. Rhodesia.

"Might we venture to suggest that a note be given in the 'Agricultural Journal' of the length of time this wheat takes to mature, so that farmers at a distance may form an idea as to the best time to sow; or perhaps advice might be given as to what is the best planting time by those who have experimented already."

[Replying to this it may be stated that the experience with wheat in Rhodesia has been chiefly as a winter crop under irrigation when it is sown in April or May and reaped in October.

In the case of the rust-proof wheat, the time of sowing which is now in question there is no Rhodesian experiences with it to go by.

In so far as experience with other wheat is concerned, when sown in October it has been reaped in March (when not rusted). Thus about sixteen or eighteen weeks will be about the time required for this rust-proof wheat as a summer crop.—EDITOR.]

Notes on Tobacco Culture.

By G. M. Odlum, Agricultural Assistant.

Many apparently think that the failure of a certain sale of Turkish tobacco, held in another African colony, to realise good prices, indicates that the market is over supplied. This is not the fact; and the low prices realised at that sale were due to other causes, the principal one being the very limited quantities of tobacco of one type offered. Small quantities are useless to a manufacturer, insomuch as they are insufficient to enable him to maintain a supply of the same quality of brands.

We have a very profitable oversea market arranged for Rhodesian Turkish Leaf that we can avail ourselves of at any time the African market fails to pay profitable prices, and growers need have no fear of over-production, if they keep their quality up to the standard demanded. It must be remembered that the whole production of tobacco in Rhodesia would only supply certain factories in other countries with leaf to keep them working for 24 hours, while the whole of the African crop is less than one-tenth of one-hundredth part of the world's annual consumption of tobacco.

Africa is now importing very large quantities of Bright Virginia Leaf, and all the factories are eagerly bidding for local-grown leaf of good quality; but it must not be forgotten that good leaf is the result of intelligently directed effort, and that all faults of commission and omission as far as the crop is concerned are discovered by the buyer, and the grower penalised. There are African buyers who are prepared at any time to purchase one million pounds of Bright Virginia Leaf of one type and good quality at 1s. 6d. a pound, as against 3d., the price paid for dark leaf, the supply of which already exceeds the demand.

Whether a planter should grow Virginia, or Turkish, or both, depends upon the type of his soil and weather conditions. The Turkish varieties are the hardier and the easier to grow, and will often return a profitable crop on soils not sufficiently fertile for Virginia, and in places where the rainfall is uncertain; while the Virginia varieties require less labour, but demand better conditions. A more complete knowledge of the tobacco plant is required for the culture of Virginia than for the production

of Turkish. Turkish varieties suffer from excessive rainfall and are of the best quality when matured during periods of dry weather, while Virginia varieties demand a fair amount of moisture and must never be permitted to be checked in their growth.

Virginia varieties are planted from November until the end of January, and Turkish varieties are largely planted during January and February, thus permitting each to mature during the weather best suited to its requirements. Virginia varieties should be manured with commercial fertilisers, while Turkish varieties are not so exacting, although applications of fertilisers are often advantageous. Flue curing is essential to the production of Bright Virginia, and while not absolutely necessary to the production of Turkish, the system has certain advantages over sun curing, particularly during periods of wet weather.

PREPARATION OF SEED BEDS.

Notwithstanding repeated failures, many have still to learn that the beds cannot be neglected without risking a crop failure. The site of the seed bed should be chosen near a water supply, but not in a place that may be flooded. After the soil has been thoroughly worked up, timber and brush should be piled on the site and the soil thoroughly baked by means of a slow fire. This is for the purpose of destroying insects and weed seeds. Better results are secured when the soil has first been moistened The bed should again be worked up and the sides at once closed in by means of brick or iron. The bed is then fertilised with commercial manure, applied at the rate of a pound to every 10 square yards. From one to two ounces of Virginia and two to four ounces of Turkish seed are sown to each 100 square yards. To secure an even distribution, mix the seed with ashes or meal; brush in with a broom or wisp of grass, and water the bed at once with a sprinkling can. The beds must be kept moist, even if it involves watering more than twice a day, but the soil must not become sodden. The bed is then covered with tobacco bed calico.

To cover without burning is to make a better breeding place for insects; to cover without closing in the sides or to close in the sides without covering is useless, for the moths that cause the destruction of the plants can creep

through any opening that a house-fly can get through. If you are not prepared to make the best kind of bed, it is wiser to leave tobacco culture alone; the matter of covering the beds is not a fad or an untested theory.

Seed beds may be from three to six feet in breadth, according to the width of covering used, and of any reasonable length. A succession of beds should be made every week or ten days, from the beginning of September until the end of December, the Virginia varieties being sown more freely during the earlier half of the period and the Turkish varieties to a greater extent towards the end.

For Virginia we recommend Hester or Goldfinder (supplied by this Department at 1s. and 1s. 2d. per ounce respectively), and for Turkish Leaf Yaka or Xanthi (supplied at 24s. per lb.).

PLANT BED COVERING.

This cloth can be obtained from the Anglo-African Trading Company, Salisbury and Bulawayo, at about 2½d. per yard.

Bacon Curing on the Farm.

By Mr. Loudon M. Douglas, Edinburgh.

(From "Douglas's Technical Leaflets.")

In the development of agriculture it is essential to keep in mind that the most profitable way to work the dairying department is by utilizing the bye-products. In the manufacture of butter the principal bye-product is separated milk, and in cheese making it is whey. Both of these commodities lend themselves to pig-feeding, and indeed, provide about the very best food for the production of bacon. So far back as 1847 this fact was recognised by Youatt, who is perhaps the most trustworthy of authors on the pig. In his treatise entitled "The Pig," he states in the chapter on feeding, that "for stye-fed pigs the washings of the dairy, as butter and skim milk, whey, etc., are excellent, and especially whey thickened with barley or oat, or pea-meal, whey being more nourishing than skim milk; the animals thrive and make flesh

so well on it that many farmers are of opinion that this mode of employing their sour milk is more profitable than making cheese. But when the swine have once become habituated to this kind of diet it must be continued, as they would fall off if put upon any other." Of course, many things have happened since 1847, and new authorities on the pig have sprung into existence since then. None, however, have materially altered the views of Youatt. Modern authors, such as Harris, Coburn, Spencer, Craig, Bondeson, Day, and others, practically confirm this opinion. It has been left to Professor Day to summarise the teachings of all the others, and to put in concise form in his book entitled "Swine," all that is worth knowing on the subject.

It seems quite certain then, that separated milk combined with barley is the ideal food for pigs, but a modification of this feed will no doubt suggest itself to many who are not in a position to use that cereal. Maize may be used along with separated milk or green food, and the excess of oil which is present, and which goes to make oily fat in the pig is to some extent neutralised. But exclusive maize feeding will not do. Some harder food such as cereals must form part of the feed, more especially when finishing off. A good plan is to graze the young pigs for five months, then stye-feed them on hard feed for two. In that way firm good bacon will be produced.

Amongst the foods which may be used are: Cooked potatoes, oatmeal and crushed oats, pollard bran, ground wheat, rye meal and separated milk, but it must always be borne in mind that what is wanted is firm meat, and this can only be produced by feeding such a ration as will not give too much oily substance.

The great point in breeding pigs is the shape or conformation. A long square deep side is wanted, and it is just as cheap to feed pigs producing such sides as it is to feed short round ones that no one wants. Different breeds suit different districts and countries. The principal breeds cultivated in Europe are large Yorkshire and middle Yorkshires amongst the white pigs; the Tamworth, which is a red breed, and amongst the black breeds, the Berkshire, Suffolk and Sussex. The Berkshire is a fine pig for crossing, and splendid results have been obtained by crossing large whites with Tamworths and then with Berkshires, but local circumstances must always determine what rule is best to follow.

It is well to know the general principles which govern the matter, and modify these to local needs.

When the pigs suitable to the district have been produced, it then remains to find out what will be the best use for them. They can be handled in two ways, viz.: (1) They can be made into bacon on the farm; or (2) they can be handled in a co-operative or other bacon factory.

(1) BACON CURING ON THE FARM.

The equipment necessary for bacon curing on the farm is small. The principal thing is to choose as cool a place for the curing process as possible, such as an outhouse, or, better still, a cellar excavated out under any of the farm buildings; a small place will do. The floor should be laid with flagstones or cement, the atmosphere should be sweet, and the place should be dark, but should be well ventilated.

The bacon pig will weigh about 217 to 224 lbs. live weight, and this pig will turn the scale at about 168 lbs. dead weight; that is with the offal excepting the head, feet, and flake lard, removed. It will be necessary, therefore, to provide a scalding vat for a pig of this size. A large half barrel or similar vessel will do. In addition to this a simple rope pulley block, a few wooden gambrels or spreaders, two or three 10 in. straight knives, a steel, 20 in. back saw, and a 10 in. Smithfield cleaver, will complete the tools required.

The pig may be first stunned by striking it sharply between the eyes with a mallet, and it is then slung by means of the pulley block, which can be fastened to the branch of a tree or a cross beam, by one of the hind feet head downwards, and a sharp 10 in. straight knife is inserted in the throat in the direction of the heart, so as to sever the main blood vessels. The blood at once rushes out, and may be caught for use in making blood puddings, or allowed to go to waste. In a few minutes the carcase will be quite free from blood, and may then be lowered into the large tub already spoken of. This tub should be previously filled about half full with water at about 160 degs. Fahr., or just so hot that the hand cannot be held in it comfortably. The carcase is turned round about in this water until the hair comes away easily in the hand. The two hind legs are then slit, so as to expose the

sinews, and these are loosened with the finger. A gambrel or spreader is then pushed in beneath them, and the carcase is hoisted again into the vertical position head downwards. It is scraped all over quite clean, by means of a blunt knife, or, better still, a pig scraper, cold water being thrown over it occasionally meanwhile, so as to cool it down as much as possible. A slight incision with a knife is then made between the aitch bones, and this is continued right down to the apex of the lower jaw. Next, the knife is inserted so as to sever the aitch bones, and the bladder and organs of gestation are removed. The crown end is then cut round and removed, along with the fat gut which has been loosened right along the back. Then the remaining guts, stomach and fat are pulled out. The liver and kidneys are taken out, and are at once thrown into cold water so as to cleanse them. The breast bone is severed by means of a saw, and the skirt is cut right round, as close to the flake lard as possible, and the heart and skirt are cut from the lungs and thrown into cold water to be cleansed. The lungs and windpipe are removed through the severed breast bone and cut off at the base of the tongue, which is left in the head, or may be cut out there and then so as to be used. All these various parts have their uses on the large scale, and they can also be utilised to much advantage on the farm. The guts or intestines should be cleansed thoroughly, then salted, and they can be used for sausage making. The liver, tongue, kidney, heart, etc., can be used fresh. The stomachs, if well washed and cleansed, make a very palatable dish.

The flake lard remains still in the carcase, and must be removed so that when that is done the whole inside can be washed with cold fresh water. The flake lard after cooling should be cut up and rendered.

It is necessary now to split the carcase in two, and this is done by making a straight continuous cut just under the skin right down the back from the root of the tail to the neck. The next cut is made deeper on the right side of the back bone, making that side clear and without leaving much meat on the bone. The left side of the back bone is cleared in the same way, so that the two sides are now separate.

In factories, where the "dead-weight" is taken, the head, feet, flake lard, and back bone are all weighed in,

but the remainder of the offal is not. If the pigs are weighed warm a deduction of 3 per cent. is made for "beamage."

On the farm, however, these matters are of no interest, as it is assumed that the farmer proposes to utilize most, or all, of the carcase in his own household.

When the head, feet, back bone and flake lard, have been removed, the sides are allowed to hang until quite cool. A cool shady spot is best for this purpose, and if possible, the carcase should be hung where there is a gentle current of air.

The next process is the curing of the meat. This cannot be carried out successfully unless the sides are cool and stiff. When this stage is reached they are taken down, laid on a table or a bench, and trimmed. The inside is scraped free from fat, and the neck is trimmed free from bloody pieces, the steaks are taken out and are utilized forthwith in the fresh state. The neck bones and aitch bones are cut loose, and the spare rib and breast bones are taken away along with these. The tops of the ribs are also sawn off, and the blade bone taken out. The large blood vein in the neck is removed, and the sides will then be trimmed complete.

It is now necessary to have ready some additional apparatus. A small pickle pump is necessary, together with a supply of pickle and a salinometer to test same. The pickle may be prepared the day before, so that it will be nice and cool. It is made from the following recipe:—

14 lbs. salt.
1¼ lbs. saltpetre.
1¼ lbs. dry antiseptic.
1½ lbs. cane sugar.

Make this up to five gallons with water, boil and skim till clear. The liquor should test 100 degs. or thereby on the salinometer, and if it does not, it should be made up to this strength with salt.

By the aid of the pump this pickle is now injected into all the fleshy parts of the meat, and the sides are then laid on a bed of salt on the floor of the curing place. The bed of salt should be about an inch thick, and a wooden stave should be used to press up the belly part of the side, which should be uppermost.

Now, sprinkle all over the side an equal mixture of dry antiseptic and saltpetre, just sufficient to whiten it, and on the top of this put a heavy layer of salt. In fourteen days thereafter the bacon will be "mild-cured," for it does not require to be touched again unless it has to be cured with the intention of keeping some months. Then, at the end of fourteen days it will be necessary to add another dressing as before, and keep for other fourteen days. The resulting bacon will be salty, but it will keep a good many months quite fresh.

When the bacon is cured, take it up from the curing bed and wash it in some cold fresh water, then hang it up so as to drain for a few days. If it is wanted as pale-dried bacon, it can be hung in the kitchen after dusting a little dry antiseptic all over it, especially into the pocket hole. It will be ready for consumption at any time, but will get a more pronounced flavour the longer it is kept. Should it be desired to smoke it, an old barrel may be requisitioned. It will require to be so deep that the side can hang freely in it. An old tin can, which has had a lot of holes punched in it is then filled with hardwood sawdust, and after lighting it, the top of the can is covered with an iron plate so that as the smoke and heat come out they do not ascend right on to the bacon, but curl round it. Three days may be taken to do the smoking, but that is a matter of taste. Of course, a better smoke house can be made by building a small place about four feet square and six feet high, with a few bars running over at the top to which the bacon can be hung, and a small ventilator on the roof; but that may be considered too expensive for the small quantity handled. Smoked bacon will keep longer than pale-dried because of the preservative qualities of the smoke.

In the curing of hams there is very little variation from the method of curing bacon. The ham is cut from the side and nicely trimmed. It is then thrown into a tub of the pickle already mentioned, and allowed to soak for two days. The blood vein is then squeezed free from blood and the ham is laid shank downwards on the floor in a bank of salt. It is covered with the curing mixture similar to the bacon, and is kept 21 days in salt for mild cure, and about fourteen days more if required for keeping a long time.

The *Wet Cure* for bacon and hams is very often practised. The meat, both bacon and hams, is simply thrown into a pickle as given, and kept there until cured, the time being the same for either mild-cured or salt-cured meats as before.

Besides bacon and hams there are many other products which may be conveniently made on the farm, such as sausages and blood puddings. Then there is endless variety in dealing with the pigs feet, houghs, heads, tongues, etc. These should all be cured in pickle and cooked according to taste. It will be found, indeed, that with a little trouble much profit and satisfaction is possible by dealing with your own pig on the farm.

Co-operative bacon curing, or bacon curing in a factory as a private enterprise, is more extensive in character than bacon curing on the farm, and involves the investment of considerable capital, which, however, usually brings a high return both directly and indirectly.

Farms in the Enterprise District.

The district lying N.E. of Salisbury on the Enterprise road was the first taken up for agricultural purposes by the early pioneers.

The country is broken and hilly, but the valleys between are highly fertile, each farm consisting of a series of these hills and vales, affording good grazing for stock, and plenty of land highly suited for cultivation, together with facilities for irrigation.

Some of these farms have been occupied for over ten years. Much of the land has been under continuous cropping during all that time without manuring, yet there is little evidence of the natural fertility having much deteriorated.

The formation is mostly schist, with here and there diorite, and in some places limestone. Towards the north the formation is granite.

On leaving Salisbury by the Enterprise road, at about eight miles out the farm Glenlorne is reached, occupied by Mr. Edmonds. On this farm skilled methods of carrying on agricultural work are to be witnessed, the thorough cultivation of the fields being a pleasure to look at.

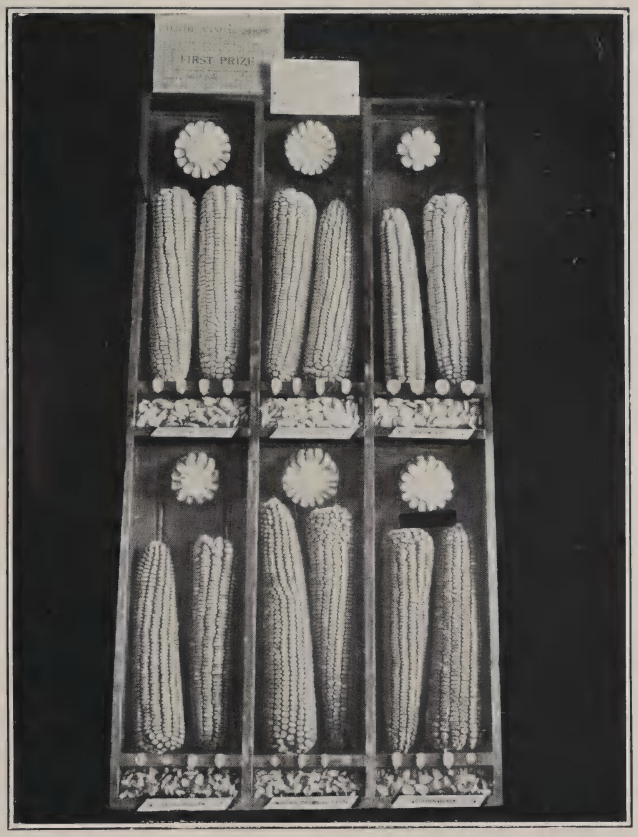


Photo by] [*H. C. Thwaits.*

Maize Cobs, exhibited by J. Watson.

The stock of cattle on the farm are in the very best condition, giving evidence of the care bestowed by Mr. Edmonds in making ample provision for winter feeding.

We were informed by Mr. Edmonds that a few acres of barley under irrigation have afforded him a remarkable supply of green forage for his milk cows right through the season, and will last until the grass comes.

Three breeding sows with their litters were revelling in pumpkins, of which there is a large supply, and very useful at this season for going along with mealies in pig feeding.

Two of the sows are highly bred Berkshires, this breed appearing to do very well. Commodious and substantial pig styes are in the course of erection and nearly completed. They are built of stone, the whole being executed with Kafir labour, and giving no small token of their handiness in building, under good supervision.

In a large and well kept orchard, the lemon and orange trees were loaded with excellent fruit.

The neighbouring farm, Gletwyn, belonging to Mr. Ross, was also one of the first to be occupied. A few Eucalyptus trees stand seventy or eighty feet high.

Good mealie crops are grown on this farm, much of the cultivated land being well adapted for that crop. A good deal of land is under irrigation, and large crops of oat forage are obtained when the cultivation and seeding can be accomplished at the proper time, but which is hindered in some seasons through the land being too wet —a circumstance that affects a good deal of the land in this quarter.

The farm Stuhm, occupied by Mr. P. Raimer, is situated on the Umfindzi River, about twelve miles or so from Salisbury. It has been under occupation for about fourteen years. This farm is a long gentle slope of land extending from a ridge of hills right down to the river. The whole belt is highly fertile, and lends itself readily to cultivation. A water furrow taken out higher up the river irrigates a good breadth, and which may be extended at will.

A crop of wheat growing here under irrigation is the finest we have seen. It is now in full ear, having the appearance of yielding over 30 bushels per acre. Barley and oats are also an excellent crop. All the stock are in good condition. During the grass season the cattle,

of which there are a large number, are enclosed in fenced paddocks.

The next farm going eastwards, and still on the Umfindzi River is under the occupancy of Mr. Homan.

Very substantial farm buildings have been erected, and a considerable amount of cultivation has been done. There is a large area adapted for agriculture besides being good for stock keeping.

Further on in that direction, at a distance of 18 miles from Salisbury, the farm Kilmuir is reached, occupied by Mr. Watson. The river Umfindzi bounds one side of the farm, and along its banks there is a good breadth of alluvial soil that would encourage being put under irrigation. There are two picturesque waterfalls on this section of the river, one of them a sheer drop of ten feet, over a ledge. The edges of the banks are shrouded with large willow and other trees, while there is a close undergrowth of ferns and sub-tropical plants.

The stream is perennial; at this time (September) there is sufficient water to supply power for a good sized mill.

The homestead is situated on that part of the farm lying back away from the river. It is placed at the foot of a range of kopjes, and faces towards the south, overlooking an expanse of land on the farm which is all good for cultivation.

Although only a twelve month in possession, Mr. Watson has got a substantial and well appointed farmhouse built, besides other outbuildings erected, or in course of erection.

Over sixty acres were under mealies last season, Mr. Watson carrying on at his new farm the growing of selected varieties without interruption.

At last Salisbury Show, although from a new and unworked farm, he still managed to carry off the greater number of prizes for maize, thus giving tribute to his skill as a grower and cultivator, besides being an indication of the excellency of the soil on the farm.

Mr. Watson's system of maize breeding rests on the principles of rigid and painstaking selection of the seed. Having his mind fixed on a certain variety, and on its type, he makes personally the most careful picking out of the cobs conforming to his ideas.

Photo by] [*H. C. Thwaits.*

Baling Hay.

Photo by] [*H. C. Thwaits.*

Field of Barley, sown April, without irrigation.

But he not only makes a selection of the cobs, but he afterwards tests the individual merits of each cob as to its germinating qualities. Taking nine grains from different parts of each cob, he germinates these lots separately in a box, and rejects for seed all those cobs whose samples show weak germinating powers.

By this means Mr. Watson maintains the purity of the variety of maize, and at the same time keeps up the growing vigour—securing a type whose fertility can be relied on.

Mr. Watson is carrying on a work in maize selection which is valuable to agriculture generally, since in the course of a few more seasons, less will have to be rejected, and more of the crop will be up to the seed standard.

He believes that the varieties of maize, the seed of which came from America, and was of the highest class, so far from degenerating, are most certainly improving through being grown in Rhodesia, and thus if the standard of purity is kept up there will be little necessity to go to America periodically for fresh seed.

The soil on which Mr. Watson is growing his maize is a brown calcareous loam of good depth, containing a large amount of organic matter. Some of the kopjes on the Chishawasha side which bound the farm are composed of limestone rock belonging to the Archaic formation. On one of these kopjes limestone had been quarried and a kiln built for burning it, but it is not now being used. The rock is comparatively pure carbonate of lime, and its potential value for agricultural purposes in Mashonaland cannot be over estimated.

The influence of the weatherings of this strata of lime rock may be traced in the verdure over an area including a large portion of Kilmuir, and also on the adjoining farms.

The kopjes in the vicinity are admirably adapted for sheep. A flock of native and Cape ewes have given a remarkably fine crop of lambs this season from a Persian ram. They all look brisk and lively, and Mr. Watson informs us that they graze continually on a kopje without ever leaving it.

A few miles further east lies the Meadows, Mr. Christian's farm and ranch. The farm is well named, being a series of valleys bounded by diorite kopjes.

There is a red soil on the slopes and black soil along the valley bottoms. Two or three perennial streams run through the estate. In some parts the rock is more like schist, but there is no banded ironstone. There is fine grazing lands on the diorite, while on the softer schist the grass grows thickly, making good hay.

A good many sweet thorn trees are to be seen both here and throughout the whole district, a variety of tree which generally indicates the presence of lime in the soil, and where there is always good grazing.

Mr. Lounsbury's Report on the Scale Insect on Salisbury Kopje.

The Secretary for Agriculture,
Salisbury.

MAMMOTH SCALE ON SALISBURY KOPJE.

Sir,—

As requested by you I have made a field study of the large scale insect infesting the Msasa tree on the Kopje, with the view of giving an authoritative opinion on the liability of its further increasing and spreading, and of suggesting what measures I think might profitably be taken to combat it. As my remarks may be used for the information of persons not versed in the intricacies of scale insect life, I think I had best lead up to what I have to say on these practical questions by an explanation in regard to the nature of the insect. I think I am correct in saying that it is the largest one of the fifteen hundred or more known species of scale insects. I submitted it to the Scale Specialist of the United States Department of Agriculture, who has unique facilities for the identification of specimens. He also failed to connect it with any described insect, and proposed for it the name of *Lophococcus maximus*. Such a term does not commend itself to the layman, so for popular use I have adopted the name "Mammoth Scale."

It is characteristic of scale insects that they get their nourishment from the sap of plants by suction, for which

Photo by] [*H. C. Thwaits.*

Mammoth Scale on Salisbury Kopje.

purpose they are provided with a very slender, long, tubular mouth organ, which is gradually worked deep into the tissue of the leaf, fruit or bark as the case may be. The insects, when young, are very active, but with the successive changes of skin which occur, the legs ordinarily fail to keep pace with the rest of the body. The sexes appear alike at first, but the males go into a sort of cocoon stage, and eventually develop into fragile flies, tiny in comparison with the other sex, and incapable of taking food. The females never become winged, and ordinarily become quite immobile when adult. This is the case with the Mammoth Scale. All the specimens now present on the Kopje are adult females, firmly attached to the bark by the mouth part; and to get one off the body has to be ruptured, or at least the mouth organ torn away. Male scale insects are usually few in numbers compared with the other sex, and no males of some common kinds have ever been discovered. Some species are able to propagate without males, at least for several generations at a time, and it is suspected that this may be the case with the Mammoth Scale. Only a single insect which I have had reason to consider the male of the species has so far been found. It now seems too late in the season for the males, however, and it is quite possible that some were present a month or two ago. The females are now beginning to lay their eggs. These are being deposited in a membraneous sac within the shell of the insect, a most extraordinary fact; and, apparently, the creature herself will slowly shrink away to a mere nothing, while meanwhile the shell will harden and become nearly filled with eggs. There seems to be nothing to indicate at what time of year the eggs hatch, and whether there are one or two generations of the insect in the course of a year. I incline to think that there is one generation only, and that the eggs hatch shortly after midsummer; but I will not be surprised if events show that there is one hatching in the spring and another in the early fall. Shells of the last generation, and some which may be of the generation before the last, are now to be found, and also innumerable moulted skins, about the size of a grain of maize, from which had emerged the young females of the present generation. The latter shells are numerous on thin branches of the tree, and apparently the female instinctively crawls back on to heavier

wood to settle down finally. One female must produce many thousands of eggs. None have finished egg-laying yet, so I am unable to form a close estimate. From the uniformity of the development at present, it is probable that the young all appear at about the same time; and I imagine that many of the trees on the Kopje must then swarm with millions of the minute creatures, and that every passing object must carry some away. As young scale insects can only crawl, they depend for their dispersion on indirect agencies such as the wind; but more to flying insects and birds upon which they may chance to crawl, and be thus unwittingly carried to other trees. In the vicinity of the most infested trees are to be found masses of a cotton like substance that burns like wax, in which bodies, which may be the shrivelled remains of young insects, are embedded. This suggests that the young, soon after hatching, secrete a dense mass of waxen threads by virtue of which they may be blown about. At present the idea is mere conjecture, and it is mentioned chiefly with the hope of inducing someone to observe the younger stages when the proper season arrives.

In common with many other scale insects, and indeed with numerous insects of other kinds, which suck the sap of trees, the Mammoth Scale exudes "honey-dew." The quantity exuded is not large considering the size of the insect, yet it is this "honey-dew" which chiefly attracts attention to the insect, and gives rise to the complaints against it. It is a clear, colourless, sweet liquid, discharged through a single orifice in the back most freely when the insect is disturbed. Sometimes a thin jet is ejected for several seconds, and this may follow no greater stimulus than blowing hard with the breath. Ants gather to get the liquid, and a certain small bird which frequents the Kopje is evidently very fond of it, poking the insect with its beak to get it. The ground beneath badly infested trees becomes heavily coated with it, and in consequence becomes shiny, black, and disagreeably sticky. A second fluid from the insect also attracts attention. This is of a light yellow colour, and resembles the yolk of egg. Apparently it is the vital fluid of the creature, and it exudes only and whenever the insect is injured. The margin of the body is bordered with brittle waxen projections which break at a touch, and cause a copious flow.

The Mammoth Scale is probably a native insect which under normal conditions is closely held in subjection by natural checks such as lady-birds, internal parasites, and fungus disease. Despite its production of thousands of eggs and its consequent capability of rapid multiplication, as now manifested on the kopje, it is probably a rare insect ordinarily and not much more numerous in one season than another. Occasionally insects such as this enjoy temporary relief from their checks, and then suddenly become extraordinarily abundant even where unnoticed before, although always present, and they may then continue to increase for a succession of generations. Sooner or later, however, the checks catch up with them again and restore the old balance. Insects introduced from one country to another may leave important checks behind and find none in the new home to take their place. This is specially true of scale insects which, because of their being attached, may easily be carried with their food plants to entirely new surroundings, while their winged enemies are left; and thus is explained much of the importance which many scale insects have assumed as pests of fruit trees. The original home of some well known and now practically cosmopolitan species is unknown, and all attempts to find and establish efficient checks for them have proved futile. It has not unnaturally been suggested that the Mammoth Scale is a recent introduction to this country, and that it will go ahead multiplying indefinitely without meeting with efficient enemies, unless such are brought to it, but there is little evidence to support this view. The insect is so conspicuously large that it could hardly be overlooked if it occurred anywhere on nursery stock; and if it had been observed, its unusual size would almost certainly have led to its having been brought to the attention of Entomologists. Then the nurseries of the Southern Colonies, from which most of the plants introduced to Salisbury have come, are systematically inspected for pests, and no trace of this insect has been found in any one of them. On the other hand, the Msasa on which the insect appears to flourish best, is a common native tree of widespread occurrence in Mashonaland; and similar cases of native scale insects unknown to science having become tremendously abundant on indigenous plants in South Africa can be cited.

As a result of my observations of the past week, I am led to think that before this outbreak the Mammoth Scale had died out or become exceedingly scarce in the vicinity of Salisbury, or else that some circumstance had prevented it ever having reached here, although present on the Msasa elsewhere in the country. Under such conditions it might have recently become established on the Kopje, without its ordinary checks, through the agency of birds or flying insects. For instance, it may have been temporarily common on a tree many miles away just at a time when a swarm of locusts happened along, and when the young scale insects were moving about, many of the young might have unconsciously wandered on to locusts and have thus been transported to the Kopje. In this connection it may be mentioned that a swarm of the strong flying red-winged migratory locust slept on the Kopje and frequented the Msasa trees there on Tuesday night.

The infestation probably began several years ago not far from the end of Albion Street in the narrow, often broken belt of Msasa trees which extends along the northern prolongation of the Kopje west of Pioneer Street. Although public attention seems only to have been drawn to the matter during the past year, it appears that a resident in infested areas had noticed it by reason of the unpleasant drift of "honey-dew" as much as three years ago, and it is quite probable that the insect had then already been on the increase for some years, as until it is numerous on a tree the drift is not sufficient to attract attention. Another resident of the locality says that he saw it in his garden six years ago. That the spread has been from the northern part of the ridge southward is indicated by the relative abundance of old shells there. At present most of the Msasa trees for a distance of about one thousand yards, from the northern end to the vicinity of Mr. Coxwell's house, are grossly infested. It seems to have been thought that the infestation was confined to this area, but it will be shown that such is far from the case. Hereabouts the insect thickly studs the trunks and larger branches, often in an unbroken layer yards in length on the limbs, and the general appearance of the trunks and of the ground beneath many of the trees is as if thin treacle had been sprayed over the surface.

The Msasa is the only wild tree infested to a serious degree unless it is the related Madondo, which I have not learned to distinguish. Some other native plants are slightly infested, but it is doubtful if more than a very few of the vast number of the insects which attempt to feed on them succeed in reaching maturity. The same may be said of nearly all the cultivated plants growing in the area, but a few silky oaks (Grevillea) are being attacked to a disquieting degree, and in one garden there is a casurina and an hibiscus from which a number of developing insects were taken. A very few are also said to have been removed from grape, citrus, and eucalyptus, and a flamboyant tree in one garden has been rather badly attacked. The Msasa, it should be mentioned, is by far the most abundant tree on the Kopje and elsewhere around the town.

No natural enemies appear to be attacking the scale at the present time. I was hopeful of finding positive evidence of internal parasitism of some stage, but in this respect I have been quite disappointed. The integument of the females is now extraordinarily tough, and it may be that this fact deters parasites, which an examination in the proper season might reveal in younger stages, yet no trace of parasite work was found on the dead bodies of such young insects as were found. Pupa shells of a species of lady-bird, apparently *Rodolia iceryae*, are numerous on many of the infested trees, and a natural inference is that the grub-like larvæ of this beneficial creature feeds readily on the young scale insects. For the present, however, the lady-bird is not amongst the trees in any stage, and it is not likely that it will appear in sufficient numbers when the eggs hatch to eat off anything approaching the increase of the pest. This lady-bird is dull black and has dull red markings on the middle and front part of the back, and is about the size of a sweet pea seed. In the absence of any record of studies on the natural checks of any close relative, I am unable to say what the nature of the most effective enemies of the Mammoth Scale may be, that is whether they are internal parasites, lady-birds, predaceous caterpillars, or otherwise. There would seem to be a splendid opportunity for some small predaceous insect to crawl into the egg-sac from beneath, and there revel amongst the eggs.

As already intimated, the scale is present to a slight degree over a far greater area than the heavily infested locality. Mr. Cameron and I have spent several days in searching for it elsewhere in the vicinity of the town, and while we found no extensive infestation away from the northern ridge of the Kopje we found reason to believe that it is spread from Hillside on the east to the Transport Camp on the west, and from the northern limits of the town and the Ayrshire railway crossing beyond the Police Camp on the north-east, nearly to Ardbennie on the south. Some groves of Msasa within these confines seem to be quite free of the insect, and so few specimens were seen in most places as to suggest that they had been brought from the Kopje. A short visit was paid to Hartman Hill owing to a rumour that it was on the Kopje there, but no trace of it was found in that vicinity. However, it is reliably stated that an old shell was found on the hill between three and four years ago. No indication of its presence was found in the Slaughter Poles enclosure, nor in the fine groves north and south of Hillside, nor any of those along the north and south roads to Simpson's farm.

The most abundant infestation away from the central area is in the vicinity of Government House and the Police Camp, particularly the latter, where old shells as well as maturing females are not uncommon. At Hillside only stains where specimens had unmistakably been attached were seen, but to the east and south of the cemetery an occasional old shell as well as live specimens were found. Old shells as well as living insects were found here and there all over the Kopje, but always scarce away from the main infestation, and particularly so on the ridge that extends to the westward. The infestation is also very light at the Transport Camp.

From the appearance of those that seem to have been infested longest, it does not appear probable that that scale is capable of actually killing any large proportion of the Msasa trees which it attacks. Very few of the trees attacked are now dead, and these only small ones which were dominated by others. Many of the smallest species of scale insects injure their food plants much more seriously than this largest of all species appears to do, and indeed it looks as if the Msasa became unsuitable for the insect before the damage reaches a degree at which the

life of the tree is endangered. A number of trees in the middle of the infested area, on which old shells are still very abundant, are almost free of living insects. Cast skins show that vast numbers of young of the present generation were present, but these insects must have perished or have wandered off to healthier trees. The trees look as if they would speedily recover if they had the opportunity, and their greatest danger now is probably from boring insects, to which weakened trees are specially liable.

If I thought the scale an introduction from an over-sea country, I would unhesitatingly advocate drastic measures to secure its extermination, including the cutting down of all the Msasa trees in the central area; but in view of the probability that it is native to the country and will sooner or later be found by enemies which will quickly reduce it to the state of obscurity from which it arose, I cannot recommend that a tree be destroyed on account of it. If left to itself, however, it is likely to prove much more of a nuisance in the coming season than in the past. Its spread up to the present has probably been considerably hindered by the frequent open spaces it has had to cross, but from where it has now reached in numbers there is an unbroken succession of Msasa trees over the entire Kopje, and its advance is likely to be much more rapid. Hence I deem it highly desirable that repressive measures be taken, and I earnestly recommend that a gang of boys be set to work to scrape off or crush all the insects that can be reached from the ground, or by the aid of ladders. This work should not be delayed, as many of the insects have begun to lay, and it is possible that eggs in those left on the ground may hatch, and the young get on to trees. Where little extra time is necessary to accomplish it, the insects scraped off should be collected and burned or otherwise destroyed. I expect that this means of lessening the pest would prove very much cheaper and more satisfactory than spraying under the conditions which exist here. It is probable that very effectual work might be done by spraying after hatching occurs, but as a costly contact wash and powerful pumps would have to be used, and as the young go far beyond where the adult females are found, and thus would necessitate the spraying of outermost parts of the trees, the expense would be great. Moreover, many of the lady-birds and other insects which

gather to feed on the young scale insects would be destroyed. If the great bulk of the insects is disposed of within the coming month, it is not improbable that the enemies that collect to feed on the young will nearly complete the work of destruction. But until the natural enemies suffice to prevent an increase, the adult females of each generation should be removed soon after they settle on the heavy wood. If systematically conducted this work of repression should not prove expensive. The trees about the Police Camp should be cleaned of the few insects which occur on them, but in general I do not suggest that the work be undertaken except where the insect is easily found on the trees. If mating is necessary for its reproduction, the insect is likely to die out where Mr. Cameron and I found it away from the main infestation and the Police Camp, owing to its scarcity and the consequent unlikelihood of fertilisation being accomplished. But if mating is unnecessary, innumerable sub-centres are already formed in which the insect will gather strength and from which it will in time spread if it is not checked. This contingency should be borne in mind, and an annual inspection made of the entire Kopje, and of valued groves elsewhere where infestation may be suspected, until the danger of further mischief has passed. The main infestation on the Kopje may be likened to a steady advancing fire, and the old scales scattered beyond to sparks thrown off by that fire. My recommendation is to oppose the main fire and to see if the sparks will not die out of themselves.

Finally I recommend that publicity be given to the outbreak, and that the public, particularly Government officials, throughout the area in which the Msasa tree grows be requested to be on the watch for the insect, and to send in specimens of anything they take to be it, with information as to its abundance. An investigation of every occurrence that offers any promise of yielding parasites should be made, and steps taken to introduce any such to the Kopje. Where the scale is at all common, shells of the past generaton are almost sure to be present, and there is no confusing these with any other insect. They are about of the shape and size of a half walnut, and of a deep chestnut brown in colour. The developing females are flatter and usually have the grey-green colour of a lichen. They remind one of small lim-

pets. Around the sides is a fringe of about two dozen short, cleft, conical projections of dull coloured, waxen plates, below each of which a bunch of fine bristles protrudes for an eighth to a quarter of an inch. If any doubt remains on the identity when a living insect is being examined, an attempt to remove it from the bark should settle the matter, for there will at once exude some of the tenacious, opaque, yellow fluid that has been described. The stain left on the bark from where one of the insects has been removed is also characteristic. It is a well defined, oval, flour-white spot, the size of the insect that made it, with a conspicuous roundish break a little nearer the top end than the middle. The break marks where the mouth part was inserted, and if the bark be cut into, a discoloured area will be found beneath it. This stain spot left by an insect catches the eye more quickly than an insect itself, and in our scouting work Mr. Cameron and I saw many more of them than we did of living insects. Perhaps birds had torn away the insects that left them.

In conclusion, I may state that on my return to Cape Town I plan to study the affinities of the Mammoth Scale with other species; and should I in this or any other way get any evidence that the insect is an exotic to this part of Africa, I will acquaint you at once.

(Sgd.) CHAS. P. LOUNSBURY,
Cape Government Entomologist.

Salisbury, 29th August, 1908.

Importation of Foreign Bees into South Africa.

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Sir,—

In view of the fact that the Cape has already passed a law prohibiting the importation of foreign bees, and also owing to the agitation that is now being raised in the Transvaal for similar legislation, I take the liberty of forwarding you copies of the correspondence that has passed between my firm and a certain party in the latter Colony in the hopes that it will elicit the opinions of Rhodesian beekeepers on the subject.

My opinion and that of my partner is decidedly averse to total prohibition, though we are in favour of stringent supervision.

It is a curious fact that although the Cape farmers can boast of the finest honey bearing flora in the world (*Protea mellifera*), with their native bee they have not yet been able to supply themselves with honey, much less export it to other South African Colonies, and now they have prohibited the importation of the only bee that is likely to lift them out of the rut.

I am,

Yours faithfully,

(Sgd.) GEORGE HURTZIG.

Gwelo, July 28, 1908.

The following was sent by Messrs. Barbour and Hurtzig to Mr. D. Cairncross, Pretoria, in answer to his circular letter of 14th July calling the attention of beekeepers to the desirability of prohibiting the importation of foreign bees into South Africa, which was quoted in the August Journal.

D. Cairncross, Esq.,
Box 163, Pretoria.

Dear Sir,—

Your circular letter of the 14th July, addressed to our Mr. Barbour, has our attention, and has caused us much serious thought.

Although at one with you with regard to the danger of foul brood, we are not prepared to recommend the employment of such drastic measures as you propose to prevent its introduction into this country.

As you must be well aware, foul brood is carried in comb and honey, and is transmitted by the habit bees have of robbing each other. We do not therefore consider that it is absolutely necessary in order to prevent the introduction of foul brood that all importation of foreign queens should be stopped, as when imported through the post in the small Benton cages that are used

for the purpose with specially prepared food, and from reliable dealers, we fail to see that there is danger of infection.

In the first place, in the long journey from Europe and America, a foul brood infected queen with her attendants must inevitably die, if forwarded through the post. On the other hand, bees in nuclei or full colonies, if bought indiscriminately in England or the Continent would be quite capable of introducing the disease.

But if instead of entirely prohibiting the introduction of foreign queens, the importation of same with proper safeguards were allowed, we fail to see that any harm would result.

Do you not, and do not the Coast Colonies allow the importation of plants, bulbs, etc., from reliable parties in Europe with safeguards? And is it not a fact that notwithstanding the prevalence of Codlin moth and other injurious pests in the Cape Colony, apples and other fruits, potatoes, etc., are allowed free importation into the Transvaal? They certainly are here, and without even protest.

We are fairly large apiarists, and have put a decent amount of money into our honey farm, and we are perfectly convinced that if our Government should prohibit the importation of Italian queens, we might as well burn our 200 odd hives, and consider our investment a dead loss.

We might mention that our wild bee appears to differ from the species that is indigenous to the Transvaal and Cape Colony, in that it is vicious, restless and dangerous to man and beast. In fact the only use for it as far as we know, and other Rhodesian beekeepers are probably of the same opinion, is for the Kafirs to rob from the bees whenever and wherever they find it.

There is another point we would like to refer to before closing, even if we are trespassing on your time, for which we apologise, and that is: What about the importation of honey and the consequent attendant danger of foul brood?

You, as a honey producer, know that bottled honey is not subjected to sufficient heat to destroy the foul brood bacillus, and you also know that there are plenty of unscrupulous people at home, more especially where the Colonies are concerned, who would think nothing of

bottling foul brood honey and selling it, either for home consumption or export, particularly the latter.

In conclusion, we are glad to have received your letter, as it will put us on our guard and enable us to make representations in the proper quarter, in order to prevent as far as Rhodesia is concerned the passing of hysterical legislation which would do a great amount of injury, if not prove a fatal blow to the bee-keeping industry of this country, at present only in its infancy.

Yours faithfully,

(Sgd.) BARBOUR & HURTZIG.

Gwelo, Rhodesia, July 20th, 1908.

The following letter on this subject has been addressed to the Secretary for Agriculture by Messrs. Barbour and Hurtzig, Gwelo:—

Sir,—

In the "Rhodesian Agricultural Journal" for August, 1908, page 552, individual beekeepers are requested to communicate to you their views on the subject of the prohibition of the importation of foreign bees into South Africa.

On the 28th July last we forwarded some correspondence on the subject to the Journal, but being probably too late for insertion in the August number, we now repeat our opinion on a subject on which we feel very strongly.

After some years' actual experience with the native bee, we are quite certain that, if the Rhodesian Government sees fit to prohibit the importation of foreign bees, and more especially Italian bees, there will never be a honey industry in the country.

It is true some few enthusiasts will take up the native bee as a hobby, but it will never develop into an industry for several reasons, amongst which the following deserve consideration:

The native bee, no one living in the country will deny, is of a vicious and extremely irritable nature, and unless kept entirely away from any living animal, it is apt to run amok and kill everything within a radius of some hundreds of yards.

We are aware that some people deny this, but let them live in a part of the country where there is a honey flow and they will come to the same conclusion; and we contend that it is practically impossible to farm the native bee commercially.

We are not now taking into consideration the enthusiast who may have half-a-dozen hives, and thinks he is bee-keeping, but the man who would take up beekeeping on business lines with the view to making a living out of it, and we maintain that unless he can stock his apiary with Italian or some other suitable foreign bee, he will never make a success of it in Rhodesia.

We are aware that foul brood is a bad bee disease, and should be kept out of the country if possible, but we say the importation of foreign bees should be permitted under regulations that should be rigorously enforced, and not prohibited altogether.

For instance, queen bees from reliable dealers consigned through the post in what are called the Benton travelling cages are no more likely to import the disease than is the free importation of honey in bottles. On the other hand, queen bees coming out in old combs that may or may not be diseased should be most certainly destroyed, and not only destroyed but burned, and not put in quarantine as they appear to be doing in Cape Colony at present.

We, as practical beekeepers, could give many reasons why the importation of foreign bees should not be prohibited in Rhodesia, but not wishing to trespass further on your time, which we are aware is valuable, we will confine ourselves to the above.

Cotton Growing in N.E. Rhodesia.

There are a considerable number of cotton plantations laid out in North Eastern Rhodesia. On the Chutica Estate there were last year 300 acres under cotton.

The altitude of this estate is about 1,300 feet above sea level. The rainfall is 40 to 45 inches from December till April.

The river Luangwa runs through the estate and along its banks the soil is a rich alluvial on which cotton grows remarkably well—large returns being yielded having a very good staple.

Away back from the river the cotton does not yield such big returns, the soil being of a light red character, but showing signs of improving under extended cultivation.

The two kinds of cotton that have done best on the estate are Egyptian "Abassi" and "Afiffi," which yield about 280 lbs. per acre per annum. The plants are cropped for two seasons.

"Caravonica" or "Silk Cotton," which is essentially a tropical plant, is being tried on this estate. It takes two years to come to maturity, and is a perennial lasting a number of years.

The first year's growth here looks very promising. It thrives best where there is a distinct "wet" and "dry" season, the dry season being used for picking, since the ripening continues throughout the dry season, or a period of six months.

"Caravonica" is of much finer quality than ordinary cotton, while the yield is also very much larger. It is worth 1s. 2d. per lb., while ordinary cotton is at 8d.

Bobs Rust-proof Wheat.

In the June issue of the "Agricultural Journal," page 386, in giving the origin of this wheat, its bringing out was attributed to Mr. Blore, of Rivenhill Farm, O.R.C., from whom the wheat was obtained by this Department. The statement that the wheat was evolved by Mr. Blore is misleading, since this honour belongs to Mr. Farrer, of New South Wales, Australia.

The "Agricultural Gazette of N.S.W.," vol. 17, 1906, states the origin of Bobs rust-proof wheat to be "the result of a cross between a sport from Blounts Lambrigg (one of the Defiance Group) and Bald Skinless Barley (Nepaul Barley)."

Three years ago the Department of Agriculture, O.R.C., imported Bobs rust-proof wheat from Australia, and after testing it at the Divisional Experimental Station made free distribution of this promising spring

Photo by] [*C. O. Thompson.*

Caravonica Cotton, Chutica Estate, N.-E. Rhodesia.

Photo by] [*C. O. Thompson.*

Cotton Plantation, Chutica Estate, N.-E. Rhodesia.

variety, consequently Mr. Blore received through the O.R.C. Agricultural Department his first consignment, which gave him, after two years' cultivation, a record crop.

We regret making the mistake concerning the origin of the wheat, and take this opportunity of giving the credit where it is due. The whole of the consignment obtained by this Department has now been distributed among the farmers throughout Rhodesia, and it is hoped that it may prove as successful in Rhodesia as it has done in the O.R.C.

Notes.

BULLOCK DRIVERS FOR FARMS AND TRANSPORT.

An advertisement placed by a Rhodesian firm in a Bloemfontein paper calling for applications for bullock drivers at a wage of £3 per month and rations has resulted in a very large number of applications being received from young Colonials experienced in working cattle who are willing to come to Rhodesia as drivers, and to enter into an engagement for a year or more.

As considerable difficulty is likely to be experienced in getting bullock drivers either for transport or farm purposes, Rhodesian farmers may be glad of the opportunity of securing the services of steady reliable white men who should be exceedingly useful on their farms.

Inquiries for further particulars should be addressed to the Farmers' Agency, P.O. Box 73, Salisbury, which has a large number of applications on hand.

EGYPTIAN CLOVER.

The Egyptian Clover seed was imported by the Department and distributed to farmers in Rhodesia last year. Up till now there has been no report come to hand regarding how it grew.

Mr. Watson, at Kilnmuir, informs us that he sowed the seed on February 4, which he considered too late, but it was that time before the seed arrived. He gave 15 lbs.

per acre, when the seed germinated rapidly and thickly, but did not stool out. It grew to about 18 inches high, and flowered, but did not come to maturity owing to the late sowing. Stock were very fond of it, the greater part of it being cut and used as stable feed for horses.

It was grown on virgin soil, but well cultivated. The land would have been poor for mealies. Mr. Watson considers the clover very promising, and we should like to have some information about it from others who have tried it.

In the August issue of the "Journal" an article appeared on "Cheddar Cheese Making," by R. Silva Jones, which is concluded in the present number.

We now have the pleasure of seeing the author in Rhodesia, and have the opportunity of hearing his opinions on the prospects of establishing a dairy industry in Rhodesia.

The value of the experience hitherto gained in the attempts to carry on the making of dairy products on a large scale has been to show that this branch of agriculture is not so easy nor so simple as it looks.

As a matter of fact, dairying is the most difficult to acquire a working knowledge of among all kinds of farming in every country.

The absence of professional skill has operated more heavily against the production of dairy products than any of the other branches, and the presence of Mr. Jones will no doubt be taken advantage of by having his services utilised in assisting to establish a dairy industry—rendering the making of butter and cheese a profitable industry in Rhodesia.

SEED POTATOES FOR THE TRANSVAAL.

The Director of Agriculture for the Transvaal has issued a warning to importers of seed potatoes that "in view of the fact that large quantities of seed potatoes from France and Germany consigned to this Colony last season were found affected with white rot fungus (*Nectria solanipers*), it is the intention of the Transvaal Government to safeguard the interests of local growers by order-

ing the destruction, or return to the consignor, of all potatoes found infected with this fungus to the extent of one per cent. and upwards."

A number of stock-owners in Matabeleland and Mashonaland have combined in bringing out a consignment of Aberdeen-Angus bulls direct from Scotland, the home of the breed.

There are a dozen under order to arrive about the beginning of December. The bulls are being selected expressly to suit the present needs of the country with reference to the class of stock they are coming amongst. They are ordinary pedigreed bulls for breeding commercial cattle, and are neither fancy priced nor special show specimens.

Besides these, several more are being personally selected by Rhodesian farmers presently in Britain, while several Shorthorn bulls are being shipped at the same time. Altogether more than twenty pure bred bulls are being imported from Britain for this season.

Reviews.

*"Agricultural South Africa," the first number of which has lately been issued, promises to find its way to the homes of farmers, and it is also full of interest to everyone who desires to promote and support the agricultural industries of South Africa.

All the articles are written by men having every qualification, both in knowledge and experience, so that the views submitted and the information given are reliable and in every way worthy of attention.

Suggestive ideas are sought to be put forth that would lead to the adoption of improvements in the methods of agriculture now prevailing, rather than advocating bringing in new products and new industries.

* "Agricultural South Africa." The Farmers' Annual. Printed and published by Cape Times Ltd., Cape Town. Price one shilling.

Mr. P. J. Hannon, in an article "A Plea for the Plough," thus remarks: "No one is more conscious than I am of the fatal absurdity of *doctrinaire* speculation in methods of agriculture, and nobody has, perhaps, more reason to acknowledge the predominating importance of local experience; and certainly I shall henceforth be the last to prescribe 'golden rules' and 'certain remedies' in Cape farming methods; but the careful observation of nearly three years has borne in upon me the conviction that modern systems of cultivation, judiciously applied, with the employment of all spare labour available, will ensure at least as large returns as are possible under the best conceived system of grazing the veld.

The aim is not that the herdsman shall grow less, but that the ploughman shall grow more, and the natural sequence, it is contended, will be a higher standard of comfort for both. I have used the words 'as large' in the comparison I venture to submit, because, clearly, if the net returns of the two systems—*i.e.*, pastoral, and pastoral and tillage—are equal, it is a national duty to adopt that which employs the greater number of workers, and adds most to the national wealth. A cultivated country is a land of homesteads and families, thriving villages and varied and remunerative industries, and is the outcome neither of Government doles nor the special dispensation of Providence, but of the energy and public spirit of a people regulated by the dictates of economic intelligence."

Dr. A. Theiler, Government Veterinary Bacteriologist to the Transvaal Government, contributes an article on 'Veterinary Science in South Africa," from which we quote: "Although every endeavour is made in South Africa to promote the agricultural development of the various colonies, the fact undoubtedly remains that the larger portion of the land is unsuitable for this purpose exclusively. The history of the past has proved that our country is very suitable for stock-breeding of all kinds, and we can safely conclude it will be even better in the future if we are in the position to remove both the obstacles which occur from time to time and those prevailing at present. The greatest drawbacks in the past have been the diseases occurring as epidemics sweeping through the whole sub-continent. Some of these fortunately have completely disappeared, and some have unfortunately remained. In addition to these a number of maladies

exist, typical in the whole of South Africa, and unknown in other parts of the world, while others are confined to certain areas. To remove these obstacles must be the aim of all the Colonies.

"The fact is quite apparent that it is not so much within the scope of the farmer to eradicate these pests, although his co-operation is necessary, as it is the duty of certain experts known as veterinary surgeons; and yet it is hardly credible that only recently South African statesmen have realised this fact. It is a noteworthy fact that rinderpest furnished the impetus to the various Governments to seek scientific aid. In other words, it became apparent that prospective ruin could only be averted by proper scientific measures. In Europe, in the 18th and 19th centuries, it was this reason that led to the foundation of veterinary colleges, the training of veterinary officers and the introduction of legislative measures, the result being that the Continent was freed from the devastating plagues, and since then stock-breeding has flourished.

"South Africa similarly has had the experience that the adoption of legislative enactments, based on scientific principles, can adequately cope with contagious diseases."

Dr. Theiler thus remarks on the position of veterinary surgeons in relation to South Africa: "The duties of a veterinary surgeon in South Africa do not end after dealing with contagious diseases and investigating into their nature. I have always considered a South African veterinary surgeon to be more of a teacher than a surgeon. The conditions of the countries, with the farms so far apart, limit the field for a private practitioner to the populated centres, and since the Government Veterinary Surgeon has to attend to his official duties, it is impossible for him to be at the call of every farmer.

"In cases where an animal falls sick or meets with an accident, the farmer must be able to help himself, but to do so he should have a certain amount of technical knowledge. In order to acquire this, he will either have to study books on the subject, to ask advice by letter, or to undergo training at a school. The final duties of a South African veterinary surgeon are in connection with healthy animals and in advising the hygienic and zootechnic principles to be adopted in breeding the various classes of stock.

"Whilst travelling round the country on his official duties, a Government Veterinary Surgeon enters so much into contact with farmers that it will be of the utmost advantage when he is in a position to discuss these subjects with the farmer, whose very progress in the improvement of stock lies in the adoption of scientific principles."

Dr. Theiler's article is largely given to the need for pursuing "Tropical Veterinary Science," commending the recent establishment by the Transvaal Government of a Research Laboratory where research investigations can be performed in this field, and where provision is made for veterinary education on the lines required for South Africa.

Mr. C. P. Lounsbury, in an article on "Locust Plagues in South Africa," gives valuable addition to our rather meagre knowledge concerning whence locusts come and whither they go. He has made studied research along the lines of actual observation in seeking to give the "Factors Accountable for Invasion," and also the "Methods of Destruction."

This article will be read with great interest in Rhodesia as well as in the other Colonies troubled with this plague.

There are many other valuable papers given in this publication. Sheep and wool, ostrich farming, viticulture, etc. Mr. G. M. Odlum contributes an article on "Tobacco Culture in South Africa," which is largely given to the description of the industry in Rhodesia.

A large number of illustrations are given throughout.

"Delagoa Bay Gazette." We have received the first number of a new publication from Lourenco Marques. The "Delagoa Bay Gazette" has been published with the view of setting forth the great possibilities of the superb harbour and of the vast agricultural resources of the surrounding provinces.

Although in Portuguese territory, and among Portuguese people chiefly, this paper is printed in English, for it is anticipated that by opening up to a wider circle the natural advantages belonging to the place—letting them be known to the stranger both as a commercial and as a health-seeking resort—Lourenco Marques will be patronised more largely than hitherto.

Delagoa Bay is not without interest to Rhodesia commercially, and we accord our best wishes to the success of the "Gazette" in pursuing its mission. Excellent photos of the bay and harbour are given.

"The Agricultural Journal of British East Africa" is a well got up publication issued by the Agricultural Department. It is a quarterly Journal, and the second number has now reached us.

Much of the agriculture in British East Africa is carried on under similar conditions of soil and climate as Rhodesia, particularly as regards stock-raising.

A good deal of information useful to both countries is to be gained by interchange of opinions in discussing common agricultural problems and the way they are to be faced, and from time to time we shall take note of those points and the way they are being dealt with.

Calves from Native Cows.

These three cows with their calves belong to Mr. W. H. Williamson, Bendaugh, Salisbury. The calves are the first cross from the pure-bred Friesland bull "Cecil John" that took first prize at the Bulawayo Show in 1906.

There are already over thirty of these calves this season, and it is remarkable with what uniformity the Friesland type is reproduced; whether the cows are Mashona or Humped, the calves are in every single in-Frieslands, while the hump is entirely gone.

In this case it can hardly be called "grading," since there is at once a change of type accomplished with the first cross, and the blend can scarcely be noticed.

As the crossed heifers grow up, it is Mr. Williamson's intention to mate them with an Aberdeen Angus bull, with the view of producing a first class beef animal.

Importation of Shorthorn Bull.

The bull "Red Ensign" was bred by Sir James Sivewright, Tulliallan, Fifeshire, N.B. He was calved in February, 1906, and is thus two and a half years old. He was first imported into Cape Colony little more than a year ago, and Mr. Browning has now secured him for service amongst his herd of dairy cows.

The bull looks a splendid animal, and well represents the very long pedigree which accompanies him. The bull as an appearance of robustness and vigour about him that at once dispels any notion that an animal so good as this is not fitted for the country.

Locust Plagues in South Africa.

FACTORS ACCOUNTABLE FOR INVASION. METHODS OF DESTRUCTION.

By Chas. P. Lounsbury, B.Sc., Government Entomologist.

(Reprinted from "Agricultural South Africa.")

Two distinct species of plague locusts ravage the Cape Colony, the Red-winged Locust and the Brown Locust. The former is the larger of the two, but the one of less importance. It is the plague locust of Natal, the eastern low veld of the Transvaal, and a strip of coast in the east of Cape Colony. Its recent visit into the last-named Colony began in 1893, and two years later its vast winged swarms covered most of the country to the coast east to south-east of Griqualand West, and, south of the coastal range of mountains, swarms migrated early in 1896 westward to Swellendam. Since that year it has been confined to the eastern seaboard. Few swarms were reported in 1906 either in the Colony proper or in the Transkei, and fewer still in the early part of 1907, when it was considered not improbable that the long invasion was practically finished. But there was great trouble from the

Photo by] British-bred Shorthorn Bull, "Red Ensign," imported by W. H. Browning, Salisbury. *[H. C. Thwaits.*

species in Natal during the 1906-1907 period, and at the time of writing there is some ground for fear that the present condition of the Cape is merely a short lull before another storm.

The Red-winged Locust should not be confused with the large, clumsy, heavy-bodied, gaudy-coloured locust which often occurs in tiny swarms in the Western Province; but when the south-western districts do get large migratory swarms of locusts they are probably always of the true Red-winged species. At long intervals the Cape Peninsula and the adjoining districts have been ravaged, and many an up-country farmer fervently hopes that this fortunate section of the Colony may soon suffer again, not from any ill will towards the vine and fruit farmers, but in order that the Government in Cape Town may be brought to realise the gravity of the locust problem inland. The last invasion of the Cape and surrounding districts occurred in 1843, on which occasion vast swarms perished in the sea and were returned by the waves with the result of impressing townspeople as effectively in death as they had the country people in life, though in quite a different manner. The stench was overpowering. Previous invasions of South-western districts by locusts are recorded in 1653, 1687 and 1747, and there is little doubt that they were of the Red-wing species. The 1747 invasion was particularly severe, the garden crops and pasturage of the then very small Colony being destroyed. Many cattle and sheep died of starvation in consequence, and meat doubled in price.

The Brown Locust was the chief migratory locust in 1907. It is pre-eminently an inland species, swarms rarely reaching the eastern seaboard and perhaps never the southern and south-eastern. The present invasion began in 1890, and reached its height in Cape Colony in 1892 and 1893. Invasions of this species have been of much greater frequency than those of the Red-winged, and the idea has prevailed since 1893 that the pest would shortly disappear, as it is credited to have done after a few years of abundance in times past. This hope of an early abatement of the plague without organised assistance on the part of man has doubtless been a potent factor in the Government neglect to wage a vigorous campaign against it. Yet sixteen years have passed since the first swarms came out of the arid north-west, and al-

though the numbers of the pest have fluctuated very considerably, and in a few seasons have been relatively insignificant, there is still no sign that the invasion is approaching a termination.

The first inland invasion of locusts to which we find definite reference began in 1797 (about eleven years after the site for Graaff-Reinet, the first Karroo town, was decided upon) and lasted until about 1808. Subsequent invasions took place in 1824-1831, 1843-1854 and 1862-1876. Thereafter until 1890 the eastern part of the country seems to have been quite free, but some swarms are said to have appeared in the drier north-central portion of the Colony in this interval.

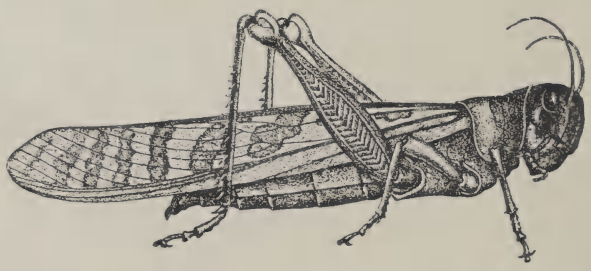
Red-Winged Locust—Wings Expanded.

It is quite safe to say that the Kalahari Desert and the country round about it is the centre from which the more habitable parts of South Africa derive the initial swarms of an invasion, and the pest spreads east, west and south, and apparently northwards as well. Somewhere or another in that vast region it is probable that the insect is present every year, and it is not at all unlikely that it is also a permanent inhabitant of extensive tracts of country

south of the Orange River, as in Bushmansland and portions of Griqualand West. The circumstances which give rise to the enormous swarms which at intervals migrate from these parts are still shrouded in doubt, which future observations, extending over an indefinite number of years, alone can dispel. However, the writer conjectures from the meagre knowledge obtainable—(1) that a period of excessive abundance of this species of locust is terminated chiefly by the agency of locust birds and fly parasites, and that therewith the pest disappeared from notice. In the parts of the country where the conditions favourable for life are most uniform from season to season, enough of the enemies may permanently remain to prevent excessive multiplication, and perhaps over large areas, as, for instance, the midland and eastern districts of the Cape, to bring about total extermination; (2) that meanwhile, in regions like Bushmansland and the Kalahari, where longer droughts prevail, the enemies are more or less completely lost through the entire absence of any food for them, while the pest is preserved in the egg stage, and thereafter left to be controlled principally by the limitation of its food. Then (3) that by the occurrence of an exceptionally favourable season, when there is an abundance of eggs in the ground, immense swarms are matured, which tend to migrate on the wind to distant parts. Naturally the bird and insect enemies, being scarce, are unable to cope with great swarms for a few seasons, and during this time the pest continues to multiply and spread, it now having unlimited good country before it. If no fresh swarms arrived the better country would, it is conjectured, become cleared of the pest by its increasing enemies soon after the climax of the invasion was reached; but reinforcements to a greatly varying extent appear to come from the desert parts for successive seasons. It is more difficult to suggest an explanation for the incoming swarms that thus prolong an invasion, but it is possible that they are in reality swarms which were hatched in the better country and which migrated desertwards soon after acquiring wings, with the result of temporarily throwing off their enemies to a large extent, or else that they are the immediate descendants of such swarms. Although it has not been demonstrated that very extensive migration of newly-winged swarms towards the desert occurs from the

country south of the Orange River, such a movement appears to be the rule in the Transvaal, according to the late Transvaal Entomologist; and altogether there is much ground for suspecting that the occupation of the invaded territory is kept up, directly or indirectly, entirely by the swarms which mature therein.

It is now established that in South Africa locusts can be fought most economically when they are in the voetganger (hopper) stage; and persons who have had experience with the measures now advocated are probably all agreed that the destruction of voetgangers *that threaten crops* is generally very profitable. Statistics collected by the Natal Entomologist on the result of the 1906 locust campaign in that Colony show that the crops, which otherwise would in all probability have been devoured by the pest, were valued at more than ten times the expenditure. Unless there is certain to be ample food for both pest and stock, it is also probably very profitable in most dis-



Red-Winged Locust—Wings Closed.

tricts to destroy voetgangers *that threaten the pasturage* only. But whether or not it is economical to destroy locusts in one district because of the damage which they or their descendants might do in other districts is at present very problematical. If thereby an extensive invasion might be averted, it certainly might pay to incur an enormous expenditure in destruction measures even in sparsely-settled, non-agricultural country, where locusts are regarded as being as much a blessing as an evil; but if all that is practicable will not materially lessen the extent of an invasion of better parts, it seems absurd to undertake destruction in parts of the country where it is not clearly profitable on local considerations.

An extremely urgent need in South Africa is more complete information on every phase of the locust problem. It is important to ascertain the areas in which the pest may survive during the years when it appears to be absent from settled parts; to learn definitely what conditions account for the periods of excessive abundance; to what extent invasions are kept up by swarms originating in inaccessible territory, and whether or not many swarms from districts where extermination is practicable return to desert parts to breed. Clearly such questions can be satisfactorily answered only through observations made throughout the whole of South Africa, subject to visitation. In the portions where active measures against the pest are undertaken, there is still more direct application for data on the occurrence and distribution of swarms, inasmuch as such information is necessary to enable the Government concerned to be prepared with supplies. For this more direct object Natal has had a system of reporting in operation for ten to twelve years in connection with its Locust Destruction Act. The Transvaal began two years ago, adopting as its method the broadcasting of many thousands of postcard forms, on which the police, farmers, and others were requested to note the passage of swarms and other information. The Cape did not organise any comprehensive system of locust destruction under Government supervision until last year. Off and on for the past dozen years, however, it has collected information from field-cornets and others; and early in 1906 my Branch began a methodical and almost complete system of collecting data, which it is hoped will be continued indefinitely. The system is a dual one, consisting of immediate card reports by private parties and monthly statements by the police. With the assistance of the local Magistrates in selecting them, one or more parties in every field-cornetcy throughout the portion of the Colony subject to visitation was appealed to to furnish us with a postcard report (1) whenever swarms arrive or pass; (2) when eggs are laid; (3) when eggs hatch; (4) when young locusts get wings, and (5) when new swarms leave the vicinity. About 500 voluntary reporters have thus been secured, and these in a general way serve to keep us posted almost up to date on the conditions in the various districts. The police reports were arranged for through the kind indulgence of the Commissioner, Lieut.-Colonel

M. B. Robinson. They consist of a monthly return rendered by each of the 300 or more Cape Mounted Police patrol stations located in the area subject to visitation. A return shows the number of farms in the area and the number and situation of those on which locusts in any of the several stages were observed, or were reported, in response to enquiry, during the previous month; and calls for a brief statement on the conditions as compared with the previous month or the previous season, and on the passage of unusually large swarms over the area. As the information given may be a month old when a return is made, and as nearly another month may elapse before all returns are received, it follows that the returns may not be of much use for forecasting purposes and for placing supplies, which purposes the immediate card reports may fulfil, but they furnish a reliable record to show the extent and intensity of the visitation month by month, from which in time valuable deductions may be made on the problematical matters alluded to above.

I repeat that in order to get full light on locust questions it is necessary to obtain information for a series of years from all the countries in the sub-continent that are visited by the pest. Early in 1906 Mr. C. B. Simpson, Transvaal Government Entomologist (recently deceased), suggested the establishment of a central office for the collection and study of data from all such parts, British and foreign. He pointed out that the officer in charge could furnish reports at frequent intervals, and immediate emergency ones when circumstances warranted it, to all the Governments concerned, thus enabling them to prepare for oncoming swarms, of the existence of which they might otherwise be ignorant; and in the course of time data would be on hand from which comprehensive deductions on the broad questions alluded to might be drawn. Lord Selborne, the High Commissioner, warmly approved of the plan, and arranged for the consideration of this and other locust matters by representatives of the Transvaal, Cape Colony, Orange River Colony, Natal and Basutoland. At a conference held in Pretoria in August, 1906, resolutions were adopted as the result of which the "Inter-Colonial Locust Bureau" was formed, and is supported by contributions from the several British Colonies, the work being under the supervision of a Board composed of one representative from each

Colony. This centralisation scheme has not necessitated any change in the system of collecting data in operation in the Cape Colony, but in addition arrangements have been made for telegraphic advice to be sent direct to Pretoria concerning the passage of very large swarms moving eastwards over Bechuanaland and Griqualand West.

It is suggested in a preceding paragraph that the sudden appearance of immense swarms in desert parts may perhaps be accounted for "by the occurrence of an exceptionally favourable season when there is an abundance of eggs in the ground." The assumption that an abundance of eggs may sometimes be in the ground in seasons when the parent insects have not been correspondingly numerous is based upon the fact that eggs of the Brown Locust may retain their vitality for years, and that they will hatch only when they are exposed to suitable temperature conditions, accompanied by abundant moisture. At irregular intervals, some travellers say about once in ten years, the dry parts alluded to receive very widespread, soaking, summer rains. Between these exceptional seasons most of the rainfall is said to be in more or less local showers. I must acknowledge that I have been able to get little positive information either for or against the idea, but I think it probable that much ground, which in the exceptional years is clothed in grass, in the years between escapes rain sufficient to hatch locust eggs, which it contains for a succession of seasons, though in almost, if not every, year throughout the area there are parts which, through being amongst those so fortunate as to catch good showers, have the pest. Under such conditions one can imagine that when a long drought is broken the soil in patches over tens of thousands of miles of territory is stocked with eggs, some laid only a few months before, others one, two or three years, and some perhaps far longer. In support of the suggestion may be mentioned the facts that the evaporation of moisture from the surface is extremely great in the parts of South Africa referred to, that the showers are generally violent and of short duration, causing much of the water to flow over the surface to lower levels instead of soaking in where it falls, and that rains in cold weather are not likely to affect the eggs. That eggs may hatch after being in the ground for a number of years is a common belief in

parts of the Colony, and although most of the statements which one is told in support of the belief are doubtless unreliable, a few appear to be thoroughly trustworthy. Nevertheless, the writer would be somewhat sceptical were it not that he has secured experimental verification. Eggs in large quantity which were secured in August, 1904, have retained their vitality. The bulk has been kept dry in tins and jars, and at intervals of a few months successive small lots have been transferred to dishes, wetted, and placed in an incubator heated to about 90° F. In every instance hatching has commenced in about ten days. Large numbers are hatching now, and it is worth noting that they are from a lot of eggs that are stored without surplus soil in a deep jar. At first the jar was closely covered, and after some months it was noticed that moulds were growing, and that a rank odour pervaded the contents; in consequence the jar has since been left open to the air. During the summer experimental lots when wetted have hatched without artificial heat, but one lot wetted during winter and kept at the room temperature did not develop. One incubated lot, which after an abundant hatching was allowed to become quite dry, was again wetted, and kept warm, with the result of bringing out a few young which had not developed on the first occasion. This was in agreement with the common observation of many intelligent farmers that several hatchings from one laying of eggs may take place, each following after a rain; in such cases it is assumed that the soil fails to receive and retain sufficient moisture from the first rains to penetrate the whole egg-pod. Under normal conditions in the districts from which they were received, the eggs used in the above-mentioned experiments would have hatched in September or October, 1904. This explanation for the sudden development of the pest in a magnitude which gives rise to the migration of mighty swarms, would be greatly strengthened if it were shown that invasions from the north-west into the Orange River Colony and the Cape districts to the southward coincided with the break-up of extensive droughts in the far north-west. Unfortunately, little meteorological information in regard to the area concerned is available. But Moffat in his "Missionary Labours" states after being absent twenty years the pest appeared at Kuruman in the good season of 1826, after several years of severe drought in

those parts, the great invasion of the Colony in 1863 and 1864 followed dry years, terminating in the terrible drought of 1862, and the last invasion came with the splendid seasons 1889 to 1891, when, after a succession of poor years, the far north-western districts shared in the wide-spread, soaking summer rains. Good years in the arid parts, however, do not necessarily harbinger an abundance of locusts, for through the agency of natural enemies or other causes in previous seasons the pest may at the time chance to be relatively scarce.

Measures for the destruction of locusts are of much greater interest to the average reader than the factors which account for the presence of the pest, and it gives a feeling of satisfaction to be able to state without fear of contradiction that methods of locust destruction have been evolved in South Africa, and are now in widespread use here that are far in advance of those used elsewhere. in the world. The one paramount remedy lies in the employment of a richly-sweetened solution of arsenite of soda for poisoning the pest in its wingless stage. Farmers naturally have been a little slow to adopt this remedy on hearing of its success owing to the fear of poisoning stock, but ninety-nine per cent. of them have only *to try* it to become thoroughly converted to its use. Hundreds of farmers in the Cape Colony who, three months ago, were strongly opposed to using it are now amongst its most enthusiastic supporters, and its future employment in all the South African Colonies as the chief measure for destroying locusts is now assured. Some small losses of stock, especially of cattle, have occurred through its use, but with very few exceptions these are acknowledged by the parties concerned to have been due to negligence or ignorance, and as not likely to be repeated now that they understand what precautions are necessary. In most cases farmers who have had the misfortune to incur a loss have nevertheless gone on using the poison. The Government this year appropriated £5,000 for locust destruction, and nearly all of this was wisely spent in introducing the arsenic remedy to the notice of the farmers. About thirty officers have been at work travelling from farm to farm in the various infested districts instructing farmers and, wherever possible, spraying swarms for demonstration purposes. The materials for spraying have been supplied gratis to applicants and pumps have been loaned

for the application of the spray. About 1,200 pumps are now on loan, and about fifteen tons of arsenite and nearly fifty tons of sugar or treacle have been given away and practically all used. It is impossible to estimate the saving in crops and grazing that has been effected, but those in the best position to judge are certain that the benefit has been enormous in proportion to the expense. Some townspeople may be inclined to criticise the free use of supplies, but in point of fact the farmer who kills the young locusts that hatch or come on to his farm benefits the general public quite as much as himself, as such locusts if unmolested would probably live to do damage on other farms, perhaps far distant; hence the general public through the Government should be glad to bear the expense of the materials if only the farmer will apply them.

The most approved formula for preparing the poison for general use is:

Arsenite of Soda	1 lb.
Sugar or Treacle	3 lb.
Water	12 to 16 gallons.

A cheap grade of rich-smelling brown sugar is much better for the purpose than refined white sugar, and treacle is still more attractive to the insects. For use against locusts under a fortnight old and for spraying on thickly-growing grass the larger quantity of water is recommended. The solution should be *very lightly* applied in a fine spray over the vegetation surrounding a sleeping swarm or in a strip a few yards wide immediately in advance of the moving swarm. The locusts will greedily attack the vegetation, being attracted by the sweetening, and in a few hours will commence to sicken. It is unnecessary to *drench* tne vegetation or the locusts, and to do so may involve risk to animals and birds. A few cases of poisoning appear to have been due to the animals concerned having eaten heavily of drenched locusts, whilst the general experience is that no apparent harm results to animals from feeding on locusts which have died merely from eating poisoned vegetation. Similarly an animal can eat with impunity a large quantity of properly-sprayed grass or bushes, whilst for it to eat the same weight of thoroughly drenched vegetation might result in its speedy death. It is obvious that a careful, experienced man incurs far less risk in using the poison than

an inexperienced man, especially one inclined to disregard precautions. Sprayed vegetation withers in a few days and thus becomes unattractive to stock, but until a heavy rain has fallen it is wise to keep animals away from sprayed places. Most accidents arise from carelessness in handling the poison, such as spilling the arsenite on the ground or leaving a receptacle about that has contained it, and leaving the prepared solution exposed in some vessel where animals can find it, or throwing it in quantity on one spot. Naturally, there is danger, too, in using much of it about any small depression in which water collects and into which it may be washed by rain. The solution has a caustic action on the skin, and may cause sores. Natives who spray with unclothed limbs should therefore be made to rub exposed parts with grease before beginning to spray; this will suffice to protect them. Food or drink should not be taken until the hands have been washed, and every other care taken that is customary in handling virulent poisons.

The quantity of sweetening which it is most desirable to use in preparing the spraying solution varies with circumstances. For spraying succulent grass, which the locusts already relish, pound for pound with the arsenite is sufficient, whilst for spraying scattered, drought-stricken bushes, which have little attraction for them, as high as six pounds to one of arsenite may be advisable.

The spreading of poisoned cut vegetation is often superior to spraying when the swarms to be treated are far from water or the veld is very dry and poor, and sometimes under other circumstances. Finely-cut green forage is generally used, and a bundle or two suffices for feeding a fairly large swarm. It is soaked or thoroughly wetted in the normal solution, and then very thinly scattered amongst and in advance of the insects, as little excess as possible over what they will eat being given. Uncut forage answers as well for killing the locusts, but any left afterwards should be carefully gathered and destroyed to prevent animals from eating it. It is said that stock will not trouble to pick up scattered bits of the finely-cut article. One man on horseback with a bag of poisoned forage can deal easily with locusts at a distance from water that would render spraying in the ordinary way a matter of difficulty. A simple way to carry the forage is to tie it in a bag, balance this across the horse, and then to slit

it on top so that it will hang as two open bags—one on each side. If the forage is very wet and the distance great, the horse should be protected from skin injury by a thick bag or waterproof sheet. The man spreading the stuff should protect his hands by greasing or oiling them if he does not wear gloves.

Before the advent of the arsenite remedies, soap spraying was the leading measure amongst many farmers, about one pound of any good bar soap being used to a paraffin tin of water. Death is caused by clogging the breathing pores, and to be effective the spraying must be very heavy. The younger the locusts the better the results obtained, and early morning spraying is better than that done in the evening; but despite apparently thorough treatment even a swarm of young locusts may have to be sprayed two or three times or more to effect its complete destruction. Except when the swarm is clustered, as at night, soap spraying is very costly in materials, and even under favourable circumstances ten gallons of soap solution will rarely do as good work as a single gallon of the arsenite poison. Also, the soap solution costs more per gallon and gives greater trouble in the preparation. Soap solution, however, considering all circumstances, is believed to be more economical than paraffin oil or any of the numerous dips and other proprietary substances recommended as remedies other than those that depend on arsenic for their value.

The use of screens for diverting swarms from cultivated lands, or into pits or other receptacles where they may be destroyed, has long been practised in many countries. Recently enterprising South African merchants have placed narrow barriers of tin on sale for the purpose. These are made and sent out in large rolls, and provision is made for supporting them in an upright position by metal pegs. Farmers who want to dry locusts for feeding purposes and who can get swarms on level land find such tin screens highly useful. They must not be tarred or painted or allowed to rust, as a perfectly smooth surface is necessary to prevent the insects getting a foothold. Cheaper screens are made of smooth table oilcloth. A simpler method of catching small swarms involves driving them on to sheets of cloth, such as wagon-sails, at night. A sail is spread out close to the sleeping

swarm, a bright light placed on it, and then the insects suddenly roused. In their confusion they jump to the light, and may then be easily gathered into bags.

Fire is commonly utilised for the destruction of swarms of hoppers, and may be by far the best and cheapest of all measures to use when the insects are in, or can be driven into, dried grass that may be safely set alight. Another old-fashioned measure which is still often used to advantage is that of trampling swarms to death by means of sheep driven back and forward over them; whilst sometimes in thickly-settled native districts as good a measure as any is for the natives to beat the massed insects with bushes. To frighten the insects off by noises, the waving of flags, and by smoke should only be practised in the case of winged swarms. Owing to the cheapness and simplicity of the arsenical remedies, there is now little excuse to allow hoppers to escape, although it is, of course, justifiable for any one to do what he can to prevent the invasion of his garden by them. For this purpose some townspeople, and farmers too, very successfully make use of strips of tin, zinc or sheet or corrugated iron, secured along or near the top of the boundary wall and projecting a few inches outwards horizontally or sloping downwards like the eaves of a house.

In conclusion, it remains to be said that the locust plague is now being fought systematically in all the British Possessions in South Africa, and that better and better work may be expected with each succeeding year. Natal and the Orange River Colony have legislation requiring land occupiers to destroy all hoppers that appear on their holdings, and in a few years it is possible that the Cape Colony and the Transvaal will have similar legislation. Although the majority of the farmers may be depended upon to do voluntarily the most that can justly be asked them, some, including many who now only fail to act because they are not sure that their neighbours will do their part, require the stimulus of obligation.

With the general adoption of the measures now at command, material losses of crops and grazing through the ravages of "voetgangers," that is immature locusts, would no longer occur; and the losses inflicted by flying locusts would be little in comparison to what they would be were the swarms permitted to mature. It is not too much to hope that this happy condition will soon be

realised. The country would still remain subject to occasional invasions by winged swarms, bred in the Kalahari Desert and in the surrounding arid and unsettled territory, but even trouble from this source would probably be vastly less than it has been in the past for, as argued in preceding pages, the supply of locusts from the desert may in large part be due to swarms permitted to breed in settled parts.

Planting Calendar for Farm and Garden.

OCTOBER.

Preparation of the land for seeding will take up the labour on the farm for this month.

Land that is broken up for the first time should receive as much cultivation as will secure an even tilth and making it free of clods, giving a rough and broken surface. Twice ploughing, followed with plenty of harrowing, will in most cases be necessary before the necessary closeness is obtained.

New land when cultivated only in a rough way is easily affected with short spells of drought, but when well tilled so that the surface is well closed up, it is much more drought resistant.

On vlei soils that are still damp mealies may be sown this month before the rains set in.

This or even earlier sowing allows the plant to get a good start and to become large sized and strong to withstand the injurious effect of much heavy rain on this kind of soil.

Early varieties of potatoes may be planted this month.

A friable sandy loam is best for potatoes. Soil that gets baked and hard on drying after rain, or that gets water-logged during the rains, should not be taken for potatoes.

The land should be prepared by ploughing and harrowing until a fine mould is obtained. The piece of ground selected for potatoes should have been ploughed and harrowed and left in a loose state over the winter months, and have the kraal manure spread over the surface for some time.

The manure can be applied in drills and the setts planted therein, but injury may sometimes arise from worms and other insects in kraal manure, so that it is safer to spread the manure broadcast over the surface and plough it in.

Potatoes should be planted 32 in. to 34 in. between the rows, and 15 in. between the setts.

They may be planted behind the plough in every third furrow—in the side of, but not the bottom—at about 5 in. from the surface.

If the tubers are large they may be cut into two or more setts, a sprinkling of ashes helps in drying up the cut surfaces. The sprouts should never be broken more than can be helped.

After planting the land should be harrowed until the surface is level.

Nearly all vegetables can be grown at this season. Different sorts require more space and deeper covering of soil than others.

Full sowings may be made of Dwarf Beans, Radish, Lettuce, Carrot, Beet, Onion, Tomato, Marrow, Pumpkin, Squash Leek, Mustard and Cress, Parsley, Egg Plant, Capsicum, etc.

Celery should be sown this month. Some care is necessary in raising the seed. It should be sown in a light soil having plenty of sand on the surface so that it will not bind on watering.

The sheltered side of a wall or building should be chosen, and it is better to be sown in boxes. Water morning and evening all seed beds and boxes.

NOVEMBER.

Planting the main crop of mealies may be proceeded with during the whole of this month. It is, however, not judicious to plant too much until the rains have penetrated the soil to a considerable depth. Light rains damping the surface for a few inches only may germinate the seeds, and a subsequent drought for a week or so may dry out the young plants.

The driest lands should be planted first, and the earlier maturing varieties of mealies should be planted on all sandy and light red soils.

Mealie planters are now generally used. The seed is planted in rows 3 ft. 2 in. to 3 ft. 4 in. wide and 15 in. to 18 in. apart in the rows. About 15 lbs. seed is required per acre. If the seed is very large, more will be required, and less if the seed is small sized.

If a mealie planter is not available, the seeds may be dropped behind the plough. As the bottom of the furrow would be too deep, the seeds should be placed in the face of the last upturned furrow at a depth of about 4 inches from the surface. By depositing the seed in every third furrow the rows will be obtained at nearly the proper distance.

On all soft red soils and also light sandy soils, rolling would be of the greatest benefit in consolidating the land and making a firm seed bed.

Pumpkins and Kafir melons should be sown this month. The seeds are dibbled in, usually two or three in each hole. The rows are 8 ft. wide and 8 ft. between the plants.

A system is frequently practised whereby the seeds are planted among the mealies either by mixing a few pumpkin seed among the mealie seed, or planting one row of pumpkins at certain intervals apart.

While this plan may have some advantages, especially in shading the crop, yet the pumpkins draw largely on the soil moisture to the detriment of the mealie crop; and also they are a great hindrance to the cultivation of the mealies—a matter of great importance in a dry season.

Pumpkins grow very well by themselves, especially on a piece of well-manured soil.

Onions that have been raised from seed sown in May, and afterwards pulled and kept over the dry season, should be planted out as soon as the ground has been well soaked with rain.

A vegetable loam or a rich sandy loam should be taken for onions. The land should be specially well prepared, and only that which has been some time under cultivation is suitable.

A good heavy dressing of kraal manure should be applied over the surface and allowed to lie until the early rains come, when all the weeds will spring. Thereafter the land should be ploughed and harrowed, when it may lie a week or two, when another crop of weeds will come up on most land.

The next ploughing should be done immediately before planting, and the land well harrowed and rolled in order to make a firm bed for the onions.

The planting is done in rows which are marked off 18 inches apart, and a small trench dug out about three inches deep. The onions are laid along and packed in by hand at a distance apart of about five inches.

Orchard and forest trees should be planted this month, taking advantage of the periods succeeding heavy rains when the ground has been soaked to some depth.

The land should be ploughed twice and well harrowed, when spade holes of depth adapted for setting in the young tree are sufficient.

As soon as the first rains come, all crops should be sown that are intended for ploughing in as green manure. Thus land that is intended to be put under crop in January will have the green crop, weeds etc., all grown up and ploughed in in time for this being accomplished.

Kafir corn or Kafir mealies, sown broadcast fairly thick, make very good material for ploughing in as green manure, since they grow a large bulk which goes to increase the humus in the soil.

Cow peas, velvet beans, white lupins, and beans of all kinds may be used for green manuring. Although not so bulky, they are all nitrogenous, and if the nitrogen assimilating bacteria are present, forming nodules on the roots, there will follow a gain of nitrogen to the soil.

Sow Spinach, Parsnip, Turnip, and other vegetables not already sown. Transplant all members of the Brassica family when large enough. A suitable period should be chosen when the weather is dull. A mulch of half decayed stable manure round the young plants will assist the growth in dry weather by conserving the moisture about the roots and less watering will be required.

A little lime worked into the soil around the roots will assist greatly in keeping away grub.

Keep the land well worked between the rows, keeping down weeds, and also maintaining a loose surface, preventing the soil hardening after rain.

Cheddar Cheese Making.

By R. Silva Jones, Government Dairy Expert.

(*Continued.*)

Process of Manufacture.

Rennetting.—The milk upon its arrival into the cheese dairy is tipped at once through the strainer into the cheese vat, and in the case of milk being bought from neighbouring farmers, is weighed and the owner is credited with the exact weight of milk supplied. Each lot should be examined carefully to see that it is in good condition before being tipped into the vat through the strainer. Great care should be exercised to ascertain the exact condition of the milk, as ripe, gassy, or bad-flavoured milk will have to be treated accordingly, as the process of cheesemaking is purely one of fermentation, and therefore the most important point to the maker is knowing exactly what condition his milk is in that he may have full control of the lactic acid. The treatment of over ripe milk will be explained later.

In the case of evening's milk it is always better to roughly skim off the cream that has risen during the night, and heat it up to about 90° Fahr., stir well and add again to the milk.

Colouring.—Cheddar cheese requires a certain amount of colouring added in order to make the cheese of a more appetising and richer appearance. The colouring should be added prior to rennetting, and can conveniently be added during the time that the temperature is being got up to requisite rennetting temperature.

The amount of colouring to be used will vary according to the market requirements, but I have found that the amount as shown on the table given will be ample, but of course makers must use their own discretion. The colouring should be diluted with about twice its volume of water and well stirred in.

Table for Colouring.

Gals.	Drs.	Mins.	Gals.	Drs.	Mins.	Gals.	Drs.	Mins.	Gals.	Drs.	Mins.
1	...	3	50	2	40	100	5	23	150	8	...
3	...	9	52	2	46	102	5	29	152	8	7
5	...	15	54	2	52	104	5	36	154	8	13
7	...	22	56	2	59	106	5	42	156	8	20
9	...	28	58	3	6	108	5	46	158	8	26
11	...	33	60	3	12	110	5	49	160	8	33
13	...	40	62	3	19	112	5	55	162	8	39
15	...	48	64	3	25	114	6	2	164	8	45
17	...	54	66	3	31	116	6	9	166	8	52
19	1	...	68	3	38	118	6	15	168	8	59
21	1	3	70	3	44	120	6	23	170	9	6
23	1	9	72	3	51	122	6	29	172	9	12
25	1	20	75	4	...	124	6	33	174	9	19
27	1	25	76	4	3	126	6	38	176	9	25
29	1	33	78	4	9	128	6	45	178	9	31
31	1	39	80	4	16	130	6	52	180	9	38
33	1	45	82	4	23	132	7	6	182	9	44
35	1	52	84	4	29	134	7	12	184	9	50
37	1	58	86	4	36	136	7	19	186	9	56
39	2	3	88	4	42	138	7	25	188	10	3
41	2	9	90	4	49	140	7	33	190	10	9
43	2	15	92	4	55	142	7	38	192	10	16
45	2	22	94	5	2	144	7	44	194	10	23
47	2	28	96	5	9	146	7	50	196	10	29
50	2	40	98	5	16	148	7	55	200	10	40

As soon as all the milk is in, apply hot water through the jacket, or in the case of steam connection turn on steam slowly and heat up to the rennetting temperature, stirring gently all the time to prevent cream from rising, and allow of equal heating. The temperature to which it is best to add the rennet is more or less, in the case of good milk, controlled by the surrounding temperature of the air; from 84° to 86° Fahr. being best, in summer at the lower temperature and according to temperature of the air so increase up to 86° Fahr. Immediately this has been done, it is necessary to find out the degree of acidity in the milk, and this is done by what is often called the "Acid or straw test," apparently receiving the second name because a piece of straw is used in order to facilitate the determination of exactly knowing when the milk commences to coagulate. This test is carried out as follows: Take 4 oz. of milk from the vat at the temperature at which the rennet is to be added, measured by an ordinary 4-oz. chemists' phial, then throw the milk into an enamel cup; then add 1 drachm of rennet and note exactly how

long the milk takes to thicken. The easiest plan to determine this is when adding the rennet, stir vigourously for five seconds, giving the milk a revolving motion in the cup, then add a small piece of straw or match, which will be carried round with the motion of the milk, and as soon as the match or straw stops revolving, the milk will have coagulated. This should take from 21-23 seconds, but one must be guided by the season of the year, the condition of the milk, and the maker in practice will soon find out as to when to allow for a second or so above or below. However, as soon as the desired test has been reached, no delay should occur in adding the rennet and proceeding with the process. The amount of rennet required to thicken the milk to give a curd of the requisite firmness is about 4 oz. to the 100 gallons; by the table for rennetting it will easily be seen the proper quantities to add from 1 gallon up to 200.

TABLE FOR RENNETTING.

Gals.	Ozs.	Drs.	Mims.	Gals.	Ozs.	Drs.	Mims.	Gals.	Ozs.	Drs.	Mims.	Gals.	Ozs.	Drs.	Mims.
1	...	...	19	50	2	...	...	100	4	...	...	150	6	...	...
3	...	...	57	52	2	...	38	102	4	...	38	152	6	...	38
5	...	1	36	54	2	1	16	104	4	1	16	154	6	1	16
7	...	2	14	56	2	1	55	106	4	1	55	156	6	1	55
9	...	2	52	58	2	2	33	108	4	2	33	158	6	2	33
11	...	3	31	60	2	3	12	110	4	3	12	160	6	3	12
13	...	4	9	62	2	3	50	112	4	3	50	162	6	3	50
15	...	4	48	64	2	4	19	114	4	4	19	164	6	4	19
17	...	5	26	66	2	4	57	116	4	4	57	166	6	4	57
19	...	6	4	68	2	5	36	118	4	5	36	168	6	5	36
21	...	6	42	70	2	6	14	120	4	6	14	170	6	6	14
23	...	7	21	72	2	6	52	122	4	6	52	172	6	6	52
25	1	...	...	75	3	...	...	125	5	...	...	175	7	...	...
27	1	...	38	76	3	...	19	126	5	...	19	178	7	...	57
29	1	1	16	78	3	...	57	128	5	...	57	180	7	1	36
31	1	1	55	80	3	1	36	130	5	1	36	182	7	2	14
33	1	2	33	82	3	2	14	132	5	2	14	184	7	2	52
35	1	3	12	84	3	2	52	134	5	2	52	186	7	3	31
37	1	3	50	86	3	3	31	136	5	3	31	188	7	4	9
39	1	4	19	88	3	4	9	138	5	4	9	190	7	4	48
41	1	4	57	90	3	4	48	140	5	4	48	192	7	5	26
43	1	5	36	92	3	5	26	142	5	5	26	194	7	6	4
45	1	6	14	94	3	6	4	144	5	6	4	196	7	6	43
47	1	6	52	96	3	6	43	146	5	6	43	198	7	7	21
50	2	...	...	98	3	7	21	148	5	7	21	200	8	...	...

The rennet should be well diluted with cold water, in order that the cold temperature may retard the action of the rennet until it is thoroughly mixed with the milk, the

diluted rennet is then added, and the whole well stirred for about five minutes, to thoroughly mix and also to prevent the cream from rising. Care must be taken not to stir too long, as the quantity of rennet added ought to start coagulation in about twelve to fourteen minutes, and if stirring is going on, or any heavy movement of milk in the vat at the time coagulation commences, a very great loss of fat will ensue together with a loss of curd.

Starters.—The use of a starter is to be most highly recommended. A starter is in reality an inoculation of the milk with a lactic ferment that has been prepared from properly sterilised milk, and at the same time been prepared in a pure, sweet atmosphere, free from taint or contamination in every way. By the use of a starter the maker is assured of having a preponderance of lactic acids germs over others, which will assure him of success and give a cheese of more full flavour and better in every way. The old-fashioned idea of using old whey from the day before is not only dangerous but should not be followed at all, the present system of Culture Starter having completely superseded it. The great drawback to whey is that it is bound to be full of all sorts of adverse germs, and it cannot be a clean inoculation so to speak, and what is very dangerous is the possibility of whey from one day's bad or indifferent cheese, inoculating the fresh milk with deleterious germs.

The culture required to produce this starter can be procured in the form of a dry lactic ferment, it is in the form of a powder purchased generally in bottles, the process is to take about a gallon of fresh sweet milk and sterilise it by heating to about 180° Fahr. and keeping it thereabouts for at least fifteen minutes, and cool to about 75° Fahr. then add according to directions sufficient to produce coagulation in about 24 hours. When coagulated, add about 10 per cent. of this to a similar amount of sterilised milk and set aside for coagulation, repeat the process again, when the starter should be ready for use.

From 2 per cent. to 5 per cent. should be sufficient to add to the milk in the vat for cheesemaking, according to conditions.

Keep the temperature of the starter as near 75 degs. as possible.

In order to keep the starter going from day to day, it will be necessary for the cheesemaker to propagate the

starter every day from the one day's starter for the next day's requirements.

A good starter should have a smooth, glossy, velvety appearance, and have a mild lactic acid flavour, clean and sharp to taste, in fact to many it makes quite a pleasant drink.

The starter should not be allowed to get too old, if it is noticed that it is what is termed "going off" make a completely new starter. Be careful not to have the starter over ripe, or the vitality will be destroyed, and do not use too much. And above all things never add a cold starter to warm milk; always heat up to the temperature of milk in the vat, and without fail always strain starter through a fine cloth into the milk.

The best kind of vessel to propagate a starter in is a stone jar, well glazed inside, without chips.

Cutting the Curd.—When the curd is ready to cut, that is when the coagulation has finished and the curd is about to sink and the whey commences to ooze slightly through at the top, it should break away perfectly cleanly from the thermometer when put in diagonally and lifted out. It shows a clear break, and not in the form of a jagged break. Another very good way is by applying the bent finger to the curd; if the curd sticks it is not ready, if clean, then it is ready to cut. The curd is now ready for cutting with the two knives as shown in illustration.

I prefer to use the vertical knife first, cutting lengthwise and then across, and afterwards with the horizontal knife. The object of this cutting is to facilitate the expulsion of whey, and by cutting the curd into small pieces, heat can be applied evenly, when by the action of the rennet and of the heat the curd contracts and expels the whey. As soon as this process is complete, wash off the hands and arms, and with the hands thoroughly clean off any curd adhering to the sides or bottom of the vat, particularly the corners. But work very slowly and quietly, the curd is very soft still, and easily breaks up, which means loss. If your curd is a "fast worker" or has a considerable amount of acidity developed, cut it smaller, as it is more easily cooked, and the whey will be more easily expelled.

Slow stirring with the hands should continue for ten to fifteen minutes before heat is applied.

The process of cooking the curd, that is of heating it up to about 98° to 100° Fahr., according to the season of

the year, is one of the most important in the whole process, and I think that a great deal of the nuttiness and mellowness depends upon the proper cooking of the curd, and the worker must by practice and experience find out a lot that it is well nigh impossible to write on paper. After the curd has been gently stirred in the whey for about fifteen minutes, heat can be applied, either by putting hot water into the jacket or by steam, in accordance with one's arrangements. The curd rake is best used after the mass has reached the temperature of 90° Fahr., the curd is then sufficiently strong to replace the hand stirring, but care must be taken to see that the corners are kept well free from curd, or it will become scorched against the hot inside of the vat. The curd must not be heated too quickly, say about one degree for every five minutes. The time taken from the completion of cutting to the finish of the cooking process should occupy about 45 to 50 minutes.

In the case of a fast-working curd a different method altogether should be employed, as your object is to as soon as possible get the curd out of the whey, and to do this add a little more rennet, cut the curd smaller, and as soon as possible start either slowly dipping the whey out or by a syphon, and allow it to run slowly away during the process of cooking, until you have it down to the level of the curd. Heat 2° higher and hand stir all the time. If the curd is still very acid, as soon as cooking is complete, run off all the whey and add water of a similar temperature and thoroughly wash the curd, and then let run off. This frees the curd of a lot of whey and necessarily retards the acidity. In the case of a gassy curd, or one that contains a lot of pin holes, and is quite spongy, give the same treatment, only the cheddaring process must be continued until all the gas has escaped and the spongy mess broken down. The cooking temperature must be varied according to the season of the year and the richness of the milk. In spring, with a low percentage of fat, a lower temperature is necessary, and *vice versa* with a richer milk a higher temperature is necessary, as rich milk tends to retain moisture. This combined with the fact that lesser moisture is necessary on account of the softening influence of the extra fat on the body of the cheese, makes it imperative to expel more moisture, and consequently a higher temperature is necessary, and

it can go up to 104° Fahr., at seasons when the milk is very rich.

In the ordinary way the curd is now left to sink in the vat to mat together and for the acidity to increase, the lid being put on to prevent any drop in temperature. Tests must occasionally be made to ascertain the amount of acidity developed. This is done by heating an ordinary piece of iron to slack heat—clean it well off, and from the vat take a small handful of curd; press the whey well out of it, and then press the curd against the hot iron and slowly draw it away, when it will be seen that the curd adheres to the iron in the form of very tiny threads, and it is in accordance with the length of these threads that the acidity is judged. The proper length at this stage should be about $\frac{1}{4}$ of an inch, but even this varies according to condition; with a rich milk allow the threads to be longer. If the curd will not correspond to this allow to remain for ten minutes and test again, but in case it shows a greater length run off the whey with all possible speed. By fixing in the strainer supplied with the vat for this purpose the whey can be run off, and the curd left in the vat. The curd is now lifted from the vat on to the cooler, a cheese-cloth having been previously laid over the bars, so that, being kept well covered all the time, and in about ten minutes is cut into strips and 6 in. square, turned over, this turning being repeated every ten or fifteen minutes. Do not pile the blocks of curd one on top of the other, but to facilitate draining I prefer to put the end of one piece on to the end of another each time. It is essential all through this process that the temperature be kept up to 90° Fahr. and above. If it is allowed to go below this it is liable to become of a soapy consistency; tests can now be made with the hot iron again to ascertain the degree of acidity, and if the threads on the hot iron extend from $\frac{3}{4}$ to an inch in length, it is ready for milling. This naturally varies as previously explained.

The mill that I prefer to use is the Australian pattern that cuts the curd into fingers with a clean cut; the old pattern tore and bruised the curd too much, which resulted in a loss of butter fat. An illustration of the former is shown, and I strongly recommend it in preference to the old pattern. The curd, when pased through the mill, should be well aired and allowed to mature. When the curd has obtained a nice silky texture, and smells

very much like fresh butter, it is ready for salting. The temperature must not be allowed to fall too much, but by the time it is ready for the salt it should be about 84° Fahr. Salt should be added at the rate of about 3 lbs. to the 100 lbs. curd, or what is sufficiently close to say, to every 100 gallons milk. A table for salting is appended:—

TABLE FOR SALTING.

Gals.	Lbs.	Ozs.	Gals.	Lbs.	Ozs.	Gals.	Lbs.	Ozs.	Gals.	Lbs.	Ozs.
1	...	½	50	1	8	100	3	...	150	4	8
3	...	1½	52	1	9	102	3	1	152	4	9
5	...	3½	54	1	10	104	3	2	154	4	10
7	...	4½	56	1	11	106	3	3	156	4	11
9	...	5½	58	1	12	108	3	4	158	4	12
11	...	6½	60	1	13	110	3	5	160	4	13
13	...	7½	62	1	14	112	3	6	162	4	14
15	...	8½	64	1	15	114	3	7	164	4	15
17	...	9½	66	2	...	116	3	8	166	5	...
19	...	10	68	2	1	118	3	9	168	5	1
21	...	11	70	2	2	120	3	10	170	5	2
23	...	12	72	2	3	122	3	11	174	5	4
25	...	13	74	2	4	124	3	12	176	5	5
27	...	14	76	2	4½	126	3	13	178	5	6
29	..	15	78	2	5	128	3	14	180	5	7
31	1	...	80	2	6	130	3	15	182	5	8
33	1	1	82	2	7	132	4	...	184	5	9
35	1	1½	84	2	8	134	4	1	186	5	10
37	1	2	86	2	9	136	4	2	188	5	11
39	1	2½	88	2	10	138	4	3	190	5	12
41	1	3½	90	2	11	140	4	4	192	5	13
43	1	4½	92	2	12	142	4	5	194	5	14
45	1	5½	94	2	13	144	4	6	196	5	15
47	1	6½	96	2	14	146	4	7	198	6	...
50	1	8	98	2	15	148	4	7½	200	6	...

If the salt is added at too high a temperature it is likely to cause butter socks in the cheese, which naturally destroy the appearance when cut, as will also too rough stirring in of the salt. Great care should be taken to see that the salt used is good and clean, and to see that it is not tainted, as salt, being a chemical compound, readily absorbs taints and odours from being kept in an unclean place. In the case of curd from over ripe milk more salt should be added, as also is the case with a wet curd, which sometimes happens.

The salt being weighed out in accordance with the scale, it should be added half at a time, and well, though quietly, stirred, to ensure it being equally mixed.

The curd must not be put to press until the salt has thoroughly dissolved. This can be easily ascertained by the curd having lost its grittiness. And the temperature should not be less than 80° Fahr., or the curd will not close together properly, and when cut will be found to be full of holes.

The mould should by this time have been got ready, that is with the cloth bandage put on, allowing about 1½ inches over at the top and bottom for the trim over, and the bottom cap previously put in. It is very necessary that all the cheese should be made as nearly one weight as possible, it greatly aids the sale of a good article, and therefore it is necessary to weigh the curd into each mould. Practice will show exactly how much green curd to put so that the mould will come nicely home and do away with the unsightly rim that is left if too much curd is put in.

The pressing should be commenced slowly and regularly. With the lever presses as shown in the illustration it will be seen that the pressure is continuous, but it should be kept well screwed up. Keep the long lever hanging at about right angles to the machine. If this be done, it is not possible to get any relaxation of weight, and in about one hour's time the weights can be applied. First the small one, later on substitute it for the big one, and later on again put both weights on, screw well up, and leave for the night. First thing next morning the cheese must be taken out of the mould, or so far out that one can see the two ends. First look to see that the bottom end cloth has nicely folded, leaving a good square edge. If it has, leave it; then pull up the cloth from the mould, put a top on the cheese, neatly turn the cloth down, cutting any off if it is too long, and return to press again. Then leave it there with full pressure on as long as possible, just giving oneself time to take the cheese out. Have the moulds washed ready for the next lot of curd. This will always give the cheese nearly twenty-four hours in the press, which is ample.

In order to prevent too much evaporation from the cheese in its early stage of ripeness, it is necessary to give it a temporary coat, and this is done in two ways, either one being very satisfactory. The first is to scald the cheese when the cheese is first taken out of the press to pull up the cloth. The cheese is dipped in water of a

temperature of 120° Fahr. and left there for about one minute, then taken out and replaced in the mould. The other is, after the cheese has finally come out of the press and allowed to dry off, to paint it with good sweet lard slightly warmed so that it can be put on with a brush. Either of these will prevent evaporation in the early stages and give the cheese a temporary coat.

The cheese is now ready for the curing room, and it is preferable to have two rooms, the first in which the cheese can stand for a fortnight or three weeks, and should be of a temperature of about 70° Fahr., and from here they are taken into the second room, which should be kept about 60° Fahr.

For the first month or six weeks the cheese requires to be turned once every day, and care must be taken that in turning the edges are not broken. They require to be lifted well off the shelves to be turned. After the first six weeks, turning every other day is sufficient, but daily will do no harm, and if time permits daily is preferable. If it is found, as is often the case, that the cheese begins to develop gas, and lifts slightly, as soon as it is noticed, the gas should be let out by pricking it with a skewer in the place where the lifted rind is noticed. If this is not done the blowing will cause the rind to separate from the cheese, and the look of the cheese will be damaged.

These rooms should be scrupulously clean and free from moulds, and in the damp weather, if it is seen that moulds appear, a good preventative is to spray a 10 per cent. solution of formaline about the room, but do not allow the solution to get on to the cheese if possible.

Before every season commences these rooms must be well cleaned out and whitewashed, and the shelves well scrubbed down. If the mould should bother very much, the burning of sulphur in the room will assist greatly.

The date of the making of every cheese should be plainly stamped thereon, in fact, I strongly advocate keeping a daily record of the work. This will be found of tremendous assistance, as in case of extra good or indifferent cheese, the cause can then more easily be ascertained, and recommend the following record to be kept daily.

Daily Record of Cheddar Cheese Making.

Date.	Amount of Milk in Gallons.			General condition of Milk.	Amount of Starter.	Setting Temperature.	Time of Adding Rennet.	Test.	Amount of Rennet.	Time of Cutting.	Cooking Temperature.	Hot Iron Test for Milling.	Amount of Salt.	Weight of Green Cheese in Lbs.	Weight of Ripe Cheese in Lbs.	General Remarks.
	Evening.	Morning.	Total.													

A record of this description ought certainly to be kept not only for the benefit of the worker, but it must be remembered that the industry in the Colony is in its infancy, but is, I think, bound to become a great factor, and we have absolutely no data of any description to work upon for the formation of dairy statistics. This would be a very great help in time to come, both from a statistical point of view and also from the point of view of tracing errors, and for working improvements.

Where the acidimeter is used in connection with the different acid tests, columns can also be left for the results obtained.

It is also highly essential that every cheese should be branded before it leaves the factory, it is far better for trade purposes. This can best be done by an ordinary stencil plate, cut round to fit the top and bottom of cheese. Either give the name of maker, or have a special name for the brand, and paint it on with ordinary black lead before it leaves the factory.

Estimates for Plants and Contingencies.

For the convenience and information of farmers I give estimates for the supply of cheese plants from 100 gallons per diem up to 500 gallons per diem. The prices quoted are by Messrs. D. E. Hockly & Co., East London, and

are for the very latest and most up-to-date machinery, and include all that is necessary. The utensils are all of the very best make upon the market.

Estimate for 100 gallons per diem.

	£	s.	d.
1 Improved Oblong Cheese Vat, 100 gallons	16	10	0
1 Double Lever Cheese Press	9	5	0
1 Improved Curd Rack and Cooler, 60″ x 28″ ..	8	10	0
1 Improved Curd Mill and Cutter	10	10	0
1 Pair Steel Curd Knives	3	0	0
1 Curd Scoop	0	5	0
1 Strainer for hanging on Vat	1	1	0
1 Wood Curd Rake, £1 7s. 6d.	1	7	6
1 Portable Boiler, 75 gallons	10	0	0
	£60	8	6

Estimate for 200 gallons per diem.

	£	s.	d.
1 Improved Oblong Cheese Vat, 200 gallons	24	0	0
1 Single Lever Cheese Press	6	5	0
1 Double Lever Cheese Press	9	5	0
1 Improved Curd Rack and Cooler, 72″ x 30″ ..	10	10	0
1 Improved Curd Mill and Cutter	10	10	0
1 Pair Steel Curd Knives	3	5	0
1 Curd Scoop	0	5	0
1 Strainer for hanging on Vat	1	1	0
1 Wood Curd Rake, £1 7s. 6d.	1	7	6
1 Portable Boiler, 90 gallons	11	0	0
	£77	8	6

Estimate for 300 gallons per diem.

	£	s.	d.
1 Improved Oblong Cheese Vat, 300 gallons	30	0	0
2 Double Lever Cheese Presses	18	10	0
1 Improved Curd Rack and Cooler, 96″ x 33″ ..	12	10	0
1 Improved Curd Mill and Cutter	10	10	0
1 Pair Steel Curd Knives	3	10	0
1 Curd Scoop	0	5	0
1 Strainer for hanging on Vat	1	1	0
1 Wood Curd Rake, £1 7s. 6d.	1	7	6
1 Steam Generator	18	10	0
	£96	3	6

Estimate for 400 gallons per diem.

	£	s.	d.
1 Improved Oblong Cheese Vat, 400 gallons	37	10	0
1 Single Lever Cheese Press	6	5	0
2 Double Lever Cheese Presses	18	10	0
1 Improved Curd Rack and Cooler, 96″ x 33″ ..	12	10	0
1 Improved Curd Mill and Cutter	10	10	0
1 Pair Steel Curd Knives	3	15	0
1 Curd Scoop	0	5	0
1 Strainer for hanging on Vat	1	1	0
1 Wood Curd Rake, £1 7s. 6d.	1	7	6
I Steam Generator	18	10	0
	£110	3	6

Estimate for 500 gallons per diem.

	£	s.	d.
1 Improved Oblong Cheese Vat, 500 gallons	42	10	0
3 Double Lever Cheese Presses	27	15	0
1 Improved Curd Rack and Cooler, 96″ x 33″ ..	12	10	0
1 Improved Curd Mill and Cutter	10	10	0
1 Pair Steel Curd Knives	4	0	0
1 Curd Scoop	0	5	0
1 Strainer for hanging on Vat	1	1	0
1 Wood Curd Rake, £1 7s. 6d.	1	7	6
1 Steam Generator	18	10	0
	£118	8	6

Australian Pattern Telescopic Cheese Moulds.

As may be required at the following prices :—

To make cheeses 6 lbs. weight, 7″ diameter, about 5″ high, 15s. each.

To make cheeses 10 lbs. weight, 7″ diameter, about 8″ high, 17s. 6d. each.

To make cheeses 20 lbs. weight, 11″ diameter, about 6½″ high, 22s. 6d. each.

To make cheeses 40 lbs. weight, 13½″ diameter, about 6½″ high, 27s. 6d. each.

Curd Rack and Cooler can be procured in any size as may be desired.

Price List of Sundries.

Cheese Bandage, 7″ Moulds, 6 lb. and 10 lb. size, 10d. per yard of 3 Tubes.

Cheese Bandage, 11″ Moulds, 20 lb. size, 8d. per yard of 2 Tubes.

Cheese Bandage, 13½″ Moulds, 40 lbs. size, 5d. per yard of 1 Tube.

Tops, 7″, 1s. per 100.

Tops, 11″, 2s. 6d. per 100.

Tops, 13½″, 3s. 9d. per 100.

Cheese Straining Cloth, 9d. per yard.

Graduated Measure Glasses, 2s. 6d. each.

Cheese Tasters, 2s. 6d. each.

Cheese Brushes, 2s. 6d. each.

Chr. Hansen's Dairy Preparations.

Cheese Colouring, in ½ gallon bottles, 9s. per bottle.

Rennet Extract, ½ gallon bottles, 9s. per bottle.

These prices are free on rail at East London, and can be slightly reduced in cost, but if they are reduced it is at the expense and economical efficiency of the plant. For instance, the imported curd mill at £10 10s. can be substituted by the old style of mill at £3, and the steam generator in the largest two sizes can be done away with. But the latter would have to be substituted by a boiler, which would save but little and greatly increase the labour. I strongly recommend that the substitutes that

I have mentioned be not used, as the original estimates are framed with a view to complete efficiency as well as the curtailment of expense.

With regard to the moulds, they have not been included in the original estimates because of the different sizes, and it is not likely that everyone will prefer to make the same size cheese. Moulds are made in four sizes, viz.: 6, 10, 20 and 40 lbs., but for our market I think the 20 lbs. cheese the most suitable. One would naturally make to the requirements of the market, though it must always be remembered that the larger the cheese the less waste there is on account of a smaller proportion of rind, and that the larger cheese ripens better than the smaller ones.

For the sake of estimating the number of moulds required, it can be taken that a 20 lb. mould would suffice for twenty gallons of milk and so on, and the number of these required must therefore be added to the cost of plant, but it is always better to have a couple of moulds too many in case of an accident, and no matter what size mould is determined on always get a few small ones, as the curd will not always evenly weigh out between the large moulds. What is over can be made into small cheeses.

This is practically the whole of the capital required for the plant, but there are still a few what may be termed working expenses, viz.: bandages and tops, the size of these will be the same as that of the moulds. Sufficient for the first season should be purchased with the plant. A few yards of cheese straining cloth will be required to make a cover for the curd rack in the cooler, and two measure glasses for measuring rennet and also a cheese brush.

With reference to the rennet and colouring the quotation is given for and at per one bottle, and of course seems high, but in the case of ordering a plant and intending going in for cheesemaking, it would be far better to order a fair quantity in original cases for importation, when a much lower quotation would be given.

Rennet and colouring both keep well as long as they are well corked and kept out of the strong light, although one should hardly order more than is requisite for one season.

September Tobacco Bulletin.

By Geo. M. Odlum, Agricultural Assistant.

Since the date of the last Tobacco Bulletin, Mr. Rice, the manager of the Salisbury Tobacco Warehouse, and the writer have met, or concluded correspondence with, the leading manufacturers of this and other countries, and have not only arranged a satisfactory sale for the whole of the crop of Rhodesian tobacco at present in the warehouses, but have opened up markets that require very largely increased quantities of tobacco. This does not mean that the careless grower now has his opportunity, for the insistence on quality is greater than ever; but it does mean that the industry has passed the experimental stage, and has become staple and certain, thus giving every farmer with suitable soil the opportunity to diversify his crops and make an increased income. The result of the negotiations has been that considerable new capital is to be invested in new plantations, and an increase of activity throughout the industry.

However, the seed sowing time is at hand, and it is only by energetic action that new planters can share in the profits this season—although it would be unwise to delay for that reason, inasmuch as a year's experience is a year's gain.

Virginia planters will have sown their first beds in preparation for November plantings, and should not neglect to make increased sowings throughout October, in consideration of the fact that December is often an ideal planting month.

Turkish planters are now making their earlier beds, for their largest sowings are during November and December.

All progressive planters have naturally burnt and covered their seed beds, and, where possible, fertilised them with commercial manures. If the seedlings are slow in growth after the first six weeks, they may be stimulated by liquid manures or light top dressings of commercial fertilisers. The fertiliser should be washed into the soil at once, for its presence on the leaves will result in injury.

It is rarely that a planter has a sufficient number of seed beds, and many suffer in consequence. If the beginner doubles his estimates in this particular, he will not have many plants to throw away.

We have before mentioned the necessity of securing fertilisers, plant bed covering, needles, sticks, twine, baskets, etc., well in advance of the season, but it is apparent that some are still delaying, and in consequence must in the end fall back upon the more expensive and unsatisfactory makeshifts.

Now that the planting season is approaching, the question naturally arises as to whether the lands are clean or whether they are full of cutworms. Fallow lands in which weeds and grass are permitted to grow are excellent breeding places for these pests, but where the field is constantly cultivated, the insects are often starved out. Any farmer will admit the value of fowls and turkeys as insect destroyers; but he often forgets to allow them the opportunity to visit his tobacco field—until after a crop has been partially destroyed. Give the birds a chance to demonstrate their worth.

The cultivation of the soil from the beginning of the season until planting time has a value that is seldom appreciated. Constant tillage conserves the moisture and means that planting may be done during rainless periods when otherwise the work would be at a standstill. The nitrates so essential to the quick growth of the young plant only develop in a soil containing moisture, and their development is also hastened by the aeration consequent upon tillage. One of the quickest growing and best crops of Turkish raised last year was planted and matured after the rains had ceased, and its success was due to the fact that the soil had been carefully tilled throughout the season. Other crops planted on roughly prepared lands at the same time were failures.

BUILDINGS.

As is generally known, the production of Bright Tobaccos is impossible without flue-barns, and their after-handling impracticable without good packing sheds. Plans of these buildings may be secured from the Agricultural Department.

Turkish planters will require a large building in which to hang their semi-dry leaf, and also in which the green leaf may be "yellowed" during warm, moist weather.

A commodious cellar becomes a necessity for "yellowing" during dry or cool weather, while without such a cellar the leaf cannot be ordered for grading or packing.

With respect to the curing frames, we will shortly offer some suggestion that will reduce the labour involved, and largely do away with the expensive bucksail.

Any method of sun-curing is impossible during rainy weather, and the Turkish planter will save himself loss during that period by the use of a flue-barn.

Warehouse Charges for Handling and Selling Leaf Tobacco, Salisbury and Bulawayo.

The charges for handling and selling leaf tobacco vary somewhat according to the condition of the leaf and the amount of work its treatment necessitates, but the following were fixed as the maximum charges:—

Dark Pipe Leaf (ungraded)	1½d. per lb.
Dark Pipe Leaf (graded)	1d. ,,
Bright Leaf (ungraded)	1¾d. ,,
Bright Leaf (graded)	1¼d. ,,
Cigar Leaf (ungraded)	2½d. ,,
Cigar Leaf (graded)	2d. ,,
Cigar Leaf (when not fermented before sale)	½d. off above.

Turkish Type Leaf.

Turkish Leaf (ungraded and unbaled)	4d. per lb.
Turkish Leaf (graded and pastelled)	1½d. ,,

Graded and ungraded refer to the condition when received by the warehouse.

(Sgd.) F. G. SMITH,
for Local Accountant.

Fruit-Fly Netting.

A limited quantity of specially selected Fruit Fly Netting has been imported by the Department, and is on sale at the Anglo-African Trading Co., Ltd., Stores at Salisbury and Bulawayo, at the following prices:—

4¼d. (fourpence farthing) per yard, 72 inches wide.
8¼d. (eightpence farthing) per yard, 144 inches wide.

Correspondence.

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Dear Sir,——

I must again trespass on your kindness, and request you to publish this letter in your next "Agricultural Journal."

Mr. Eyles, in his valuable article "Vegetable Fibres for Rhodesia," Part II., which appeared in the August No. of your "Agricultural Journal," has again made some slight errors, which may be very misleading to farmers in this country who are attempting or thinking of growing fibres.

Before going into these particulars, I would like to point out that it was not I who attacked Mr. Eyles's figures and statements, as he infers in his last article, but on the contrary it was Mr. Eyles in his first article on "Vegetable Fibres for Rhodesia" which appeared in the April No. of the "Agricultural Journal," who attacked my figures and statements in my letter, which you very kindly published in your October No., 1907.

The letter I wrote you, and which you published in your June No., was simply a reply for the benefit of farmers in Rhodesia, as I happened to have been in the hemp and fibre business for about 15 years in England, and was looked upon more or less as an expert there.

I doubt very much if there is anyone in Africa who has had the chances of learning what I was forced to learn of the hemp and fibre business, and it was this fact which made me come forward and correct some of Mr. Eyles's figures and statements.

As regards Mr. Eyles on my "personal character" in his August article, this I shall ignore entirely, as I neither care what he, or anyone else thinks about me, nor has it as far as I can see, anything whatever to do with growing fibres in Rhodesia.

But errors or misleading statements in connection with fibres and fibre-growing is another matter altogether, and for the benefit of Rhodesia, as a Rhodesian farmer I think it my duty to come forward and correct these.

1st. Mr. Eyles quotes Messrs. W. H. Hindley & Co., of London, as "the best London authority" in attempting to prove that my figures as regards the average prices of jute are incorrect. (I will leave the readers of the "Agricultural Journal" to judge whether he has done so or not.)

Messrs. W. H. Hindley and Co. may be as far as I know "the best London authority," but London is not one of the markets for jute, and for one bale of jute that is used in London, a thousand bales are used in Dundee.

The two big markets for jute in the world are Calcutta and Dundee, and for the most reliable information as regards jute I would advise anyone to go to these cities. Before leaving this matter, I would mention that I have a letter before me, dated November 27th, 1907, from Messrs. Ide and Christie, 72, Mark Lane, London, E.C., who are probably the largest fibre brokers, auctioneers, and valuers in the world, who write me confirming my letter which appeared in the October (1907) No. of the "Rhodesian Agricultural Journal," and which Mr. Eyles attacked. They also inform me that I was wrong in that letter in stating that Messrs. W. H. Hindley and Co. were brokers of hemp and fibres, but that they were merchants and dealers.

2nd. Manila Hemp (*Abaca*).—Mr. Eyles quotes the "Kew Bulletin on Fibres," pages 95 and 107, which states that "this plant will not grow in any country having a distinct dry season." All I can say is that this information is entirely wrong, and that the Phillippine Islands, where up to now all the Manila fibre has been grown, have a most decided and distinct dry season every year, and often not a drop of rain falls there for nearly six months. The rainy season in these islands includes June, July, August and September, when often 60 inches will fall. The cool season is October, November, December, and

January, when little rain falls, and the hot season is February, March, April and May, when not a drop of rain falls.

In this season, however well seasoned the wood may be, tables, wardrobes or door-panels will split from end to end, or top to bottom, with a noise like a pistol shot, on account of excessive dryness.

The Manila hemp (Abaca) requires a rich volcanic loam soil and a high altitude; these are the two essential things, and both of these Rhodesia possesses, and I have the greatest confidence in thinking that this king of fibres can be grown well in certain parts of Rhodesia, provided always we can get the genuine plants here, and not imitations as so often happens.

3rd. Sunn Hemp I repeat is not a "jute substitute." There is no special meaning in the word substitute; a jute substitute simply means that in manufacturing it will "take the place of" or substitute jute.

I care not who Mr. Eyles's authority is, but this I do know that one cannot manufacture and weave Sunn hemp to take the place of jute.

I have a little Sunn hemp here, and if anyone likes to examine same compared to jute, it will not take me two minutes to prove I am right.

If Mr. Eyles still thinks I am wrong, let him write to any actual manufacturer and weaver of jute cloths. Let me here warn my readers from taking everything for Gospel that has been written by such authorities as Mr. Eyles quotes. In the main, of course, they are correct, and the books most valuable, but one must always remember the trade secrets which exist, and which no firm will explain *in toto* to a writer. Let me give an example There are every year sold and paid for several million pounds worth of Manila ropes; these ropes are guaranteed by the manufacturers to be pure Manila hemp, and the colour has to be the same as quality, "Fair Current." It costs about £7 per ton to make the fibre or hemp into the finished article, and yet the majority of contracts are placed at a lower price than the actual cost of "Fair Current" Manila hemp.

This would mean on the face of it a loss of £7 per ton to the manufacturer, and yet the manufacturer makes big profits.

Now, is the manufacturer going to explain his secret to the writer of a book? And the same thing applies to a large grower of a particular hemp or fibre who has found another secret out which enables him to obtain £2 or £3 more per ton than his neighbours.

In this country I have been sold pure Manila hemp ropes which on examination I have found contain not a single thread of Manila fibre; also I have had to pay 1s. 6d. per lb. for bag twine supposed to be flax, but which was entirely faked jute, and worth only about 2¾d. per lb.

These few instances will explain how tricky the hemp and fibre business is, and how easy it is to give information *not quite the truth*, and this *not quite the truth* makes all the difference in the world.

Now, Mr. Editor, I will not encroach on your valuable time and space any more on hemps and fibres, but will come to a subject which I consider infinitely more important—of such importance is it that I hope and believe it may begin a new epoch in the history of Rhodesia. By this I mean a new industry which will bring the one necessary element required into this country (*i.e.*, money) to help to make Rhodesia what she ought to be, the wealthiest country in the world.

To commence with, I want to know is there a Government botanist in Rhodesia of such proven qualification that anyone can take a plant or tree to him and get it classified. I am more than ever certain that such a man is needed at present. It is 20 years since I took first prize in botany at one of the largest of England's public schools, and yet I find myself to-day practically ignorant on this subject. It would take me two or three years' hard work to come up to where I left off 20 years ago, and another two years to get myself up to date again.

I mention all these details because it has enabled me to classify a few plants and trees, and yet I still find myself hopelessly at fog in many plants and trees I have noticed out here which may be very valuable indeed. Now for what I have found.

The two principal discoveries are trees, and these trees are, I believe, most valuable timber.

1st. The white iron wood tree. (I am ignorant of its Latin name or genus.) Some of the larger trees are 80 to 100 feet high, and two or three feet in diameter.

There are thousands of tons of this wood in the country; neither the borer nor the white ant will touch it. I have had one tree down a white ant's nest for two years, and it is as good to-day as when I put it down. I am informed that the two wooden posts which hold the skip in its place for crossing the Mazoe River at Simonia were put in by Mr. George Reid, of the Public Works Department, some ten years ago, and that they are as good to-day as when they were put in.

This wood, although extremely hard, could be sawn into logs and planks, and would make the strongest and best heavy building wood, or even furniture, in the world. For ordinary fencing poles for farms, in place of iron, nothing can beat them, and for wood blocks for wood-paving, I think they would wear better than the best of the West Australian hardwood.

2nd. The true mountain mahogany tree, with the wavy dark grain. There are thousands, nay, millions of tons of this wood in the country, and I believe this wood is worth £20 to £30 per ton.

At the present time the young trees are being cut down for poles and firewood for the mines. On my own farm, where a large quantity has been cut for mining purposes, it has been too much trouble to cart them away, and the poles are lying rotting on the ground where they were cut more than eighteen months ago.

It is to prevent this wicked loss to the country that I am now asking you to publish this letter. This mahogany tree has nothing whatever to do with the so-called mahogany berry tree which is not a mahogany tree at all.

The tree I am talking about is the most valuable of all mahogany, and it rarely goes 2 feet diameter.

In fact I believe this species of mahogany grows to a larger diameter in Rhodesia than in the other countries where it is found; this particular genus rarely going more than 15 inches in diameter in other countries.

When the Directors of the Chartered Company were in Salisbury, I tried my utmost to get an interview with them to tell them of these two valuable timber trees, but they were too busy to see me, and had already had an interview with Chishawasha in connection with the valuable timber in Rhodesia.

The trees I am speaking of do not grow at the altitude of Salisbury, but commence where the altitude is 1,000 feet lower, so probably the Chishawasha Fathers never have seen these mahogany trees.

The natives tell me this tree grows right to Zambesi from here, and that they cut the young trees down for the sake of the small branches for making wicker baskets of. It is therefore impossible to say what damage is being done to these trees by the natives alone.

It was my intention when I was refused an interview with the Directors to say nothing whatever about these trees, but let them get destroyed, as it was of no benefit to me or any other farmer on the Gold Belt, we having no right of any kind to timber or new discoveries of anything we may happen to make. But lately I see this is a foolish narrow-minded policy which will benefit no one; further, it is quite possible the Government may have the same opinion of my character as Mr. Eyles has been courteous enough to put in writing. So instead of hitting back, I am giving the Government the benefit of my knowledge gratis.

I shall be curious to hear if I shall ever receive a letter of thanks. Again apologising for the space my letter will take up in your "Journal."

Yours faithfully,

(Sgd.) J. COOKSON, Junr.

Brundrett, Mazoe, September 3rd, 1908.

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Dear Sir,—

I am laying out an orchard, and have read Mr. McIlwane's articles in the "Agricultural Journal" on Citrus planting, etc., with much pleasure; but in a pamphlet by Messrs. Pickstone I see that frost kills off the trees. Now here I have registered frost at least four days this season on my verandah, so of course it would have been more severe in the open. Will this preclude me from embarking in Citrus cultivation, and how much, if any frost, will they stand?

I thank you for your advice *re* sore feet in imported bull, and the treatment has much improved him.

Under separate cover I send two samples of fibre growing wild here. Are they known?

Yours sincerely,

(Sgd.) HAROLD M. SMART.

Indiva Farm, Gwelo, August 22, 1908.

The reply given by the Secretary for Agriculture proceeded:—

"With reference to your inquiries *re* 'Citrus' growing and the amount of frost they can stand, I beg to state that the time citrus trees are most liable to be injured by the frost is when they are quite young and standing near the ground. If they are protected for the first season by placing shields of grass round them during the months when the frost is prevalent, they will stand three or four degrees of frost without injury.

"Low-lying situations where the air is quite still are much more susceptible to frost than higher situations in the open.

"The light frosts which occur during the winter seasons do not appear to have much effect on citrus trees when once they get a good start."

"The first of the two samples of fibre, the 'Water Rush,' is of no value as a fibre. It might possibly be suitable for paper making if procurable in sufficiently large quantities at a low cost. The second sample is strong, but somewhat harsh and short. It is impossible to state from the sample sent what the fibre is, but if identification and value is desired, a large sample, about 10 lbs. weight, should be sent of the fibre and the plant, when it will then be examined and reported upon.

"If such a sample is forwarded, it should be stated whether it is found in sufficient quantities to warrant its exportation, if found to be of commercial value."

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Dear Sir, —

Every farmer must have experienced a desire for some reliable indication of the correct time of day, or for some means or standard by which to set his timepiece.

Could you induce any of your readers, contributors, or any member of the Company's staff to give a simple way of constructing a sundial? It would be of the greatest service to those who live in outlying districts.

Will anybody oblige?

(Sgd.) C. S. HERON.

Eagle's Nest, Headlands, August 4th, 1908.

FIGS.

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Sir,—

I have heard it repeatedly suggested that if the many varieties of common figs could be grafted on to the wild stock of this country that we would get rid of the fig borer. With this object in view, I grafted a wild fig with our cultivated varieties. I was successful in getting several to grow and the amount of growth put on in one season was very good, one shoot putting on six feet. It came into bearing the second year with good and juicy fruit. The third year I saw by the "sawdust" that a borer had got between the stock and the scion. I cut it down and found the borer.

I have always been under the impression that the borers did not attack the wild fig. On a recent trip to Inyana, in company with Major Everett, we found under a very fine wild fig tree some brownish eggs which resembled in shape those of the Cameleon. On breaking one I found that it had the embryo of what I would call the fig borer, and on further examination we found that at the roots of the wild fig there were large numbers of eggs. The branches also showed signs of the attacks of the beetle. It is plain therefore that the wild fig is just as subject to the attacks of the borer as the cultivated varieties, but that they are able to make good the wood destroyed by the borer; that the eggs of the beetle are deposited at the roots of the wild fig, where they hatch out and mature.

I would therefore advise anyone who has figs in his orchard to destroy all wild figs in the vicinity, and to thoroughly cultivate round the roots of his trees in the autumn and winter months, and if he could allow his poultry free run so much the better.

I send a few eggs.

T. B. HULLEY.

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Sir,—

I have read with interest the article on "Cattle Breeding in Mashonaland" by C. C. Macarthur, in the August issue of your "Journal," and now take advantage of his request that his remarks would lead to further discussion on the part of others.

I quite follow with Mr. Macarthur in everything he says, but would it not be rash for ranchmen to discard a bull like the Africander, and put the very purest bull procurable in his place?

If it is impossible to expect a pure-bred bull to do well amongst the herd—without feeding morning and night—then I take it that the offspring will require feeding also.

The question is: Will it pay ranchmen to feed the progeny of say three or four hundred head breeding stock?

My humble opinion is, that as slowly and gradually as our veld improves, so in the same ratio, let us slowly grade up to the standard Mr. Macarthur suggests. Again, it is no criterion to experiment with five or six native cows and a pure-bred bull, against a herd—because where the six or seven would get pickings on this veld and get fat—a herd would be starving.

I am, Sir,

Yours truly,

(Sgd.) RALPH BLISS.

Lone Cow Estate, Ayrshire, Southern Rhodesia.
September 18, 1908.

Export of Maize Oversea.

The arrangements which have been made for facilitating the export of maize beyond South Africa have now been published for the information of farmers in Rhodesia.

The amount per bag 2s. 6d.—covering all charges—is a reasonable one, and is such as will henceforth prevent a glut in the local markets when the supply exceeds the demand.

Although during this present season there is no export to be expected, yet it will be reassuring to farmers to know that they may pursue maize growing to any extent for next year's crop, without the fear of prices being reduced through the local markets being over supplied.

BEIRA AND MASHONALAND RAILWAYS.

EXPORT OF MAIZE OVERSEA BEYOND SOUTH AFRICA.

On and from 1st September, 1908, the following arrangements will come into operation for the export of maize oversea:—

1. The Railway Company undertakes, subject to the following conditions, to receive, for export *via* Beira, consignments of maize at any station on the line of railway between Bulawayo and Beira—including branches—and to dispose of the same on account of the sender in England at market price on arrival, and to remit the amount realised by the sale of the maize, less 2s. 6d. per bag to cover rail, freight, shipping charges, wharfage, stamps, insurance, commission and other charges incidental to the conveyance to and disposal of the maize in the English market:—

(*a*) The amount remitted to the sender will be the price obtained on disposal less 2s. 6d. per bag.

(*b*) The Railway Company does not undertake to land maize on the English market on any particular date, but the most expeditious transit reasonably and economically possible will be arranged. The maize will be disposed of in England for cash as quickly as may be consistent with securing satisfactory prices at the rates ruling at the time. The net amount realised will be paid to the sender by the Railway Company without delay.

(*c*) The Railway Company will be responsible for ordinary risks, but against any special risks such as heating, weevils, etc., consignors must insure themselves if they desire to cover themselves against such risks.

(*d*) The Railway Company reserves to itself the right to refuse any maize found to be weevily.

(*e*) Maize will be sold on weight as ascertained at port of shipment, but if necessary an allowance of 2 per cent. for sifting and drying out in transit may be claimed should it be ascertained on delivery that such loss has occurred.

Minimum Consignments.

The minimum number of bags per consignment which will be accepted for export is 100 bags.

Notice of Shipment.

To facilitate shipping arrangements, intending exporters should notify the Station Master at least a fortnight before handing in consignments of the quantities they intend to export.

Bags.

All bags must be new, double sewn, and must contain 200 lbs. full weight nett. Arrangements are being made whereby bags may be obtained from the Railway Company by growers of maize at a reasonable cost for cash on delivery. Particulars as to cost of bags, etc., will be notified later.

Grading.

All maize for export will be graded by a Grading Officer appointed by the Railway Company at Beira.

Each bag will be marked according to grade.

The grades are:—

Fair average quality	Flat White.
,, ...	Flat Yellow.
,, ...	Round Yellow.
,, ...	Mixed.

Maize not coming up to the authorised standard will be marked "Below Grade" and sold as such.

Cash Advances.

The Railway Company has arranged to advance to the senders one-half of the current value immediately maize is accepted for shipment at the port of despatch. (Such advances to bear interest at the rate of 6 per cent. per annum.)

Samples of the various grades will shortly be available for examination at all stations. Samples may also be obtained from the Department of Agriculture, Salisbury, at a cost of 1s. per sample.

C. WIBBERLEY,
Manager.

Salisbury, July, 1908.

Arrangements have been made with the Beira and Mashonaland Railways to provide facilities for the export of maize from Rhodesia to the United Kingdom. These arrangements have been attended with some difficulty, and the Railway Companies have made great sacrifices in their rates in order to assist growers to reach the English market. It is earnestly hoped that when Rhodesian growers are in a position to respond to the facilities offered they will remember that they also can contribute materially towards the success of an enterprise which must prove of great benefit to the whole of Rhodesia.

The principal point to bear in mind is uniformity of quality and type.

Until farmers have ascertained accurately how the more valuable small round-berried yellow varieties of maize (such as is grown in South Russia, known to the trade as Odessa and Cinquantina) crop in Rhodesia, growers are recommended to aim at uniformity of quality in flat, white maize, such as:—

(1) Hickory King,
(2) Boone County,
(3) Salisbury White,

and one good variety of round yellow maize.

Further information and advice can be obtained from the Agricultural Department, Salisbury, where samples of official standards of quality for export can be seen, or they can be obtained at a cost of 1s. per sample on application to the Department.

The maize should be sent forward reasonably free from dirt and cob, and entirely free from weevil. Nothing would militate so seriously against the success of maize export from Rhodesia as that oversea buyers should be in doubt as to the quality of the shipments coming forward.

The maize will be disposed of in England for cash as quickly as may be consistent with securing satisfactory prices, at rates ruling at the time. The amount realised by the sale of the maize, less 2s. 6d. per bag to cover rail freight, shipping charges, wharfage, insurance, commission, and all other charges, will be immediately remitted to the sender by the Railway Company.

The Railway Company has arranged to advance to the senders one-half of the current value immediately maize is accepted for shipment at the port of despatch (such advances will bear interest at the rate of 6 per cent. per annum).

WEEVIL.

Nearly all countries where maize is grown are troubled with weevil, and the greatest possible care is taken to destroy them and reduce the evil.

The importance of making every possible effort to prevent mischief from the weevil pest cannot be too strongly urged upon growers in Rhodesia.

All refuse, dust and blowings obtained when the maize is being prepared for market should be immediately burned, and any method whereby weevil can be trapped and destroyed should be adopted and encouraged.

Maize which is only slightly affected can be passed over a wire screen with a mesh sufficiently fine to allow the maize to run over and the weevil to fall through, when the latter can be brushed up and destroyed.

All lofts and sheds where maize is stored should be periodically brushed down and the refuse and dust burned. The walls should be lime-washed from time to time, and with the lime should be mixed a proportion of carbolic and Russian tallow or other grease.

Further information can be obtained from the Agricultural Department, Salisbury.

Epitome of Cattle Inspectors' Returns.

JULY AND AUGUST, 1908.

SALISBURY.

District free from contagious disease.

BULAWAYO.

No fresh outbreaks contagious disease. The cattle removed from the Coast Fever infected area in January last still remain healthy.

Animals tested with Mallein on importation: Horses, 179; mules, 306; donkeys, 369. All proved healthy.

SELUKWE.

This district is now free from contagious disease. The last case of African Coast Fever occurred in July, 1907. No alteration, however, will be made in the restrictions on cattle movement until about the end of the year.

GWELO, ENKELDOORN, HARTLEY, MELSETTER, GWANDA, BULILIMA, AND MANGWE.

These districts are free from contagious disease.

VICTORIA.

This district is now free from contagious disease. The last definite case of African Coast Fever occurred in June, 1907. Two doubtful cases occurred the following August, since when all the infected cattle have remained healthy.

UMTALI.

African Coast Fever.

Fresh Outbreaks: None.

Existing Outbreaks: At No. 1 Camp (Raheen) the removal of the two infected herds to clean veld was satisfactorily carried out.

At No. 2 Camp, owing to the restricted amount of clean veld at our disposal, we have been unable to eliminate the disease from the infected herds. Temperatures are taken daily, and all animals showing symptoms of fever are removed to a small enclosure. It is hoped by this method to limit infection to a very small area.

At No. 3 infected area, the removal of the infected herd to clean veld is now proceeding.

Tuberculosis.

A case of Tuberculosis occurred in a beast recently imported from the Cape Peninsula. All in contact are being tested, but owing to Redwater re-action the process is most difficult.

General.

Scab is not included in the above owing to the difficulty of obtaining accurate and complete returns.

It is prevalent, as it always is at this season of the year, amongst native flocks.

The present winter is proving to be one of the severest on record for cattle and small stock, and the losses from poverty are very considerable.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Market Rates for Agricultural Produce (Wholesale).

Bulawayo market prices for week ending September 11 :—

The Grain Market this week is reported as being normal so far as business is concerned, but prices have risen slightly. There is a good demand for Trek Oxen, mostly from farmers, who seem to have secured a number of orders for transport riding for the mines. Well-bred Heifers for breeding purposes are keenly sought after. There is a good demand for Slaughter Sheep, which are difficult to get of the right quality. Onions and Potatoes have risen in price.

GRAIN.—Merchants' Prices.

Yellow Mealies	12/– to 12/9	Salt (Colonial) per bag...	16/– to 16/6
White „	13/– „ 13/6	Onions	30/– „ 32/6
Kaffir Corn, Mixed ...	11/6 „ 12/6	Potatoes	28/6 „ 30/–
Inyouti	9/6 „ 10/9	Monkey Nuts	10/6 „ 11/–
Oats (Colonial)	22/– „ 23/6	Beans	22/6 „ 25/–
Bran	15/– to 15/6	Pumpkins per ton ...	130/–
Forage, per 100 lbs. ...	10/– „ 10/6		

LIVE STOCK.

Slaughter Cattle, fat, per 100 lbs.	35/6 to 37/6	Trek Oxen ...	£9 to £10 5s.
Slaughter Sheep (local)	17/6 „ 19/–	Bechuanaland Goat Ewes	12/6 to 15/–
„ „ (Colonial)	22/6 „ 25/–	Persian Ewes, ¾-bred ...	17/6 „ 20/–
Local Heifers, 2 years	£8 10s. to £10	Persian Rams	£3 „ £5
„ Cows ...	£12 10s. „ £15	Horses, unsalted	£20 to £25
Dairy Cows ...	£25 „ £30	Mules (inoculated)	£25 „ £28 10s.
Colonial Heifers...	£10 „ £16	Donkeys	£6 „ £9

Johannesburg: Market prices as supplied by Hubert Morisse and Co.:—

WEEKLY MARKET PRICES.

Barley, per 163 lbs. ...	7/6	to	8/6	Lucerne, per 100 lbs. ...	7/6	to	8/3
Bran, per 100 lbs. (Colonial)	7/3	„	7/6	Manna	3/-	„	3/9
Chaff, best, 100 lbs. ...	2/6	„	3/-	Transvaal Hay	8d.	„	1/5
„ medium	2/-	„	2/3	Oats, per 153 lbs. ...	7/6	„	9/6
Eggs, per doz. (Colonial)	9d.	„	10d.	Potatoes, best, per 153 lbs.	24/-	„	27/6
Salt, per bag	4/6	„	6/3	„ medium „	19/6	„	23/6
Forage (Transvaal) ...	4/-	„	5/-	„ inferior „	17/-	„	19/-
„ (Colonial), best, pr. 100lbs.	5/6	„	6/-	Onions, 120 lbs. (Colonial)	20/9	„	22/6
„ „ med., „	3/6	„	3/9	Turkeys, Cocks	6/-	„	10/6
S. Meal, best fine ...	26/-	„	27/9	„ Hens	5/-	„	6/-
Rye	11/-	„	11/9	Fowls	2/-	„	4/6
Wheat	19/-	„	20/6	Ducks	3/-	„	3/6
Mealies(HickoryKingWhites)	10/11,		11/2	Geese	4/9	„	6/-
„ (O.R.C. Whites)	10/10,		11/-	Pigeons	8d.	„	9d.
„ (Yellow) ...	11/-	„	11/6	Butter (O.R.C.)	1/-	„	1/6
Kaffir Corn, per 203 lbs.	11/9	„	13/3	Pumpkins, each	4d.	„	6d.
Hay, Sweet (Transvaal)	2/-	„	2/6	Beans, per 200 lbs., sound	13/-	„	46/-

LIVE STOCK.—Prime Oxen are scarce and in good demand. First-class Milch Cows are scarce. First-class Trek Oxen are scarce and in demand. There are plenty of poor and old cattle offering at low rates. Tollies have come forward freely and the market is overstocked just now. Hamels have come forward freely, but really good sheep are scarce. Good Lambs are scarce and in demand. Heavy Boer Kapaters are scarce and in demand. Prime Porkers, 60 to 100 lbs., are scarce and find a ready sale. No demand for heavy or poor pigs. Mules and Donkeys are scarce and dear, the latter particularly. Breeding Stock is a glut.

BREEDING STOCK.

Quotations are :—

Slaughter Oxen, prime—£11 10s. to £14 10s.
Slaughter Oxen, medium—£9 10s. to £11.
Slaughter Cows—£5 to £7 10s.
Beef, per 100 lbs., prime—£1 12s. to £1 14s.
Beef, per 100 lbs., medium—£1 8s. to £1 11s.
Milch Cows, Cape—£16 10s. to £27 10s.
Trek Oxen—£7 10s. to £9 10s.
Tollies—£4 10s. to £5.
Sheep (Cape and Bastard)—5¾d. per lb.; 15s. 6d. to £1 5s. 6d.
Sheep (Merino)—6d. per lb., 16s. 6d. to £1 7s. 6d.
Slaughter Ewes—12s. 6d. to 18s. 6d.
Lambs, 9s. 6d. to 14s.
Goats (Boer Kapater)—11s. to 19s. 6d.
Pigs, per lb., live weight—2½d. to 3¾d.
Mules, large—£17 to £22.
„ medium—£15 10s. to £16 10s.
„ small—£13 to £15.
Horses, good—£18 to £25.
„ Ponies—£12 to £16.
Donkeys—£6 to £7 10s.
Heifers, 12 to 18 months—£6 to £6 10s.
„ 2 to 3 years—£7 to £8 10s.
Cows, breeding—£9 to £10.

Kimberley market prices as supplied by James Lawrence and Co.:—

Bran, per bag 100 lbs. ...	7/6	to	8/-	Yellow Mealies (Col.) 203 lbs.	10/9	to	11/6
Barley, per bag 163 lbs.	7/6	„	12/-	White Mealies (Colonial),			
Beans, Sugar, bag 203 lbs.	30/-	„	35/-	hard, 203 lbs.	10/9	„	11/6
„ Kaffir, 203 lbs. ...	20/-	„	25/-	White Mealie Meal, 183 lbs.	11/9	„	12/3
Chaff (Colonial), bale ...	4/6	„	9/6	Oats, per bag 150 lbs. ...	9/6	„	11/-
„ „ pressed, 100 lbs	3/-	„	4/-	Lucerne Hay, per 100 lbs.	5/-	„	6/-
Forage, per 100 lbs., good	4/6	„	5/3	Onions, per bag 120 lbs.	21/-	„	22/6
„ „ inferior	3/-	„	4/-	Potatoes, per bag 163 lbs.	17/6	„	23/-
Kaffir Corn, S. African mixed	11/6	„	12/-	„ (local)	18/-	„	24/-
„ White	11/6	„	12/6	Tobacco, per lb., good ...	4d.	„	7d.
Boer Meal (Col.), unsifted	23/6	„	26/6	„ „ inferior	1d.		
„ „ sifted	26/-	„	29/-	Wheat, per bag 203 lbs. ...	19/-	„	21/-
Flour (Col.), per bag 100 lbs.	15/6	„	16/6	Butter, per lb., fresh ...	1/5	„	1/6

SLAUGHTER.

	£ s. d.	£ s. d.
Oxen, good, prime, 600 lbs. upwards	... 7 10 0	to 10 10 0
Cows, good, 450 lbs. upwards	... 5 0 0	„ 8 0 0
Calves	... 4d. per lb. dead weight	
Pigs, 100 lbs., clean,	2½d., 3d. lb. live wht.	
Lambs, 30 lbs.	... 0 8 0	to 0 10 0

	£ s. d.	£ s. d.
Hamels, 40 to 45 lbs.	0 10 0	to 0 13 6
Cape Sheep, good	0 10 0	„ 0 13 6
Kapaters, good	... 0 10 0	„ 0 13 6
Oxen, Trek	... 6 0 0	„ 7 0 0
Riding Horses	... 10 0 0	„ 25 0 0
Draught Horses	... 10 0 0	„ 22 10 0
Mares	... ... 9 0 0	„ 20 0 0

Remarks.—The Market for Mealies and Kaffir Corn is firm, and prices are advancing. Forage and Oats are unchanged. Colonial Early Rose Seed Potatoes enquired for. Table Potatoes in demand, especially Early Rose. Sound dry Onions firm. Fresh Butter finds ready sale. Market glutted with Eggs, also Cabbages. Fat Poultry in demand. Oranges firmer. Slaughter Stock firm.

Salisbury: Prices of produce as supplied by Messrs. Wightman and Co.:—

Mealies	... ...	13/–	to 14/–
Rapoko	... ...	10/6	„ 11/–
Potatoes, per lb.	...	3½d.	„ 4d.
Onions, per lb.	.. ...	4d.	
Oat Forage	... ...	12/6	„ 13/–
Manna Forage	... ...	8/6	to 10/–
Pumpkins, per ton	...	75/–	„ 80/–
Ground Nuts, per bag	...	7/–	„ 8/6
Beans, per bag	... ...	25/–	„ 35/–

Live stock prices supplied by Messrs. Whitfield & Co.:

Ordinary Milk Cows	£12 10s.	to	£15
Mashona Cows	... ...	£9 „	£10
Trained Oxen	... ...		£10
Untrained Oxen	... ...	£7 to	£8
Slaughter Cattle, per 100 lbs.	...	40/–	
Well-bred Heifers	... ...		£15
Horses, fair class Hacks		£25 to	£30
Mules, first class	... ...		£25
Donkeys, Colonial	... ...		£7
Sheep, Colonial Ewes	...	28/–	to 30/–
Slaughter Sheep, Colonial		28/–	„ 30/–
Fowls, Colonial Hens	...	3/6	„ 5/–
Pure-bred Fowls	... ...	10/–	„ 15/–
Turkeys	... ...	15/–	„ 18/–
Ducks	... ...	4/–	„ 7/6

For Transport Cattle in fair condition there is a good demand. Milk Cows are also in keen demand. Slaughter stock prices are hardening. There is a good demand for Ewes and Slaughter Sheep. Mules are a slow sale, and the same with Donkeys. Owing to the northern ports being empty of cattle there is every indication in the near future of prices stiffening. Owing to Victoria District being thrown open there are certain supplies coming from that quarter, but so far as can be learned the supply will not cover the demand. In the Hartley and Mazoe Districts Transport Cattle are much in request. In the British Grain Market Messrs. Fear, Colebrook & Co., Ltd., Southampton, report August 29th:—"Prices remain about unchanged for Maize, with a very much restricted demand. Forward Maize is rather easier. Oats and Wheat remain unchanged. English Wheat is coming out very fine, quite the best quality we have had for many years, though we have had much larger crops."

SOUTH AFRICAN STUD BOOK.

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock and to maintain the purity of breeds, thus enhancing their value to the individual owner and to the country generally.

Applications for Membership and entries of Stock should be addressed :

For Cape Colony to—

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to—

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For Orange River Colony—

E. J. MACMILLAN, GOVERNMENT BUILDINGS, BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.

Government Notices.

No. 188 of 1906.

26th July, 1906.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the regulations promulgated by Government Notices Nos. 264 of 1905 and 164 of 1906 and declare the following to be of full force and effect in lieu thereof within the Province of Matabeleland, exclusive of the District of Gwelo as described and defined by section 4 (*c*) of the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which area is hereby declared to be an area infected with a destructive disease and is hereinafter called the said area.

1. No cattle shall be moved from any other part of the Territory of Southern Rhodesia into the said area.

2. The movement of cattle to, from or across any defined area appearing in the schedule hereto or any area which may hereafter be added to that schedule so long as such area remains in and is not withdrawn from the schedule is absolutely prohibited save and except as is provided for in sections 3, 6 and 7 of these regulations.

3. The movement of all cattle within the said area is prohibited save and except

(*a*) On permission granted by an Officer specially authorised thereto by the Administrator.

(*b*) Within the boundaries of any single farm where such cattle are de pastured.

(*c*) Within an area of land enclosed by a substantial fence.

(*d*) Within a radius of four miles of any native kraal situate within the boundaries of any Native Location or Reserve, and as is hereinafter further provided.

4. The movement of cattle for slaughter, *bona fide* farming, mining or breeding purposes or for private milk supplies shall be permitted under the written authority of an official thereto duly authorised subject to the following terms and conditions:

(*a*) That cattle are moved to the nearest or most suitable railway station or siding, and thence by rail to their destination, or, where the district is not served by a railway by the most suitable route to their destination, all cattle travelling by road shall be under the personal supervision of a responsible white man approved of by the Cattle Inspector or of a native approved of by the Native Commissioner and the Cattle Inspector of the district within which the movement takes place.

(*b*) That written permission of owners, occupiers or managers of all occupied land, and in the case of Native Reserves, of the Native Commissioner of the District over which such cattle shall pass to the nearest station, siding or destination is obtained; provided that in the event of such owners, occupiers, managers or Native Commissioner refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause.

(*c*) That such cattle shall before being moved, be thoroughly disinfected by dipping or by spraying to the satisfaction of the Officer issuing permit, and at the expense of the owner of such stock, and if intended for slaughter shall where possible be branded under the supervision of the Officer issuing permit with the letters "V.D." on the near side of neck.

(*d*) That cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (*e*) hereof, be immediately taken to the prescribed quarantined area and there be quarantined and confined, and where not branded in terms of clause (*c*) hereof, be similarly branded under the supervision of a duly authorised officer.

(*e*) That all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying in terms of clause (*c*) hereof shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area.

(*f*) That all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive ; all such cattle shall after admission to the said area be considered as likely to be infected with disease and if found wandering outside the said area or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock.

(*g*) That on arrival at destination cattle other than slaughter cattle shall be dipped or sprayed and shall be effectually isolated from all other cattle on the same land for a period of four weeks.

5. The movement of working cattle may be permitted under the following conditions only :—

(*a*) Within a radius of six miles of any working mine or mine in course of development for the purposes of such mine, provided that such cattle shall only be moved under a permit of a duly authorised officer, and shall be dipped every fourteen days or where no dipping tank is available be thoroughly sprayed with an approved dip, provided further that such permission shall not be granted when it conflicts with any other section of these regulations, or if such movement is considered dangerous to other cattle within the six mile radius.

Sub-section (*b*) cancelled by Government Notice No. 216 of 1907.

6. In the event of the failure of pasturage or water on land on which cattle are located, the movement of such cattle will be permitted, provided :—

(*a*) That such movement shall be to nearest available pasturage by the most suitable route.

(*b*) That written consent be obtained in terms of Section 4 (*b*) hereof.

(*c*) That movement shall be by permit only of a duly authorised officer, and under the supervision of a responsible white man, or of a native approved of by the Cattle Inspector and Native Commissioner of the district.

7. For the purposes of cleansing an area from disease the Controller of Stock may, on the authority of the Administrator and on the advice of the Chief Inspector of Cattle, and subject to such conditions as may be stipulated, permit the removal of cattle from a scheduled area to an adjacent clean area.

8. All applications for the removal of cattle under sections 4 and 5 hereof shall be submitted to and approved of by the Veterinary Department before being granted and when such movement is from one Native District to another the application shall be submitted for the approval of the Government Veterinary Surgeon at Bulawayo and the Native Commissioners of the Districts to and from which the removal is made.

Section 9 cancelled by Government Notice No. 114 of 1908.

10. All veld-fed animals within the limits of the various Commonages or Townlands or other centres where there is common grazing ground, and wherein cases of African Coast Fever have occurred within two years of the date of publication hereof, and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days : provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

11. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations in respect of any dipping done at a public dipping tank :—

For cattle (over six months)	3d. per head.
For horses and mules	3d. ,,
For calves (six months and under)	2d. ,,
For small stock	½d. ,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under above tariff.

12. Any disinfecting by spraying required to be done under these regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed ; provided that the Inspector may, at his discretion, carry out such disinfection with the assistance of and at the entire cost of the owners of the animals to be sprayed, the cost of such disinfection being payable at the time of the spraying.

13. Whenever the owner, occupier, or manager of a farm shall adopt measures for the cleansing of his cattle running thereon, either by spraying or dipping or by any other method permitted by these or any other regulations, the Cattle Inspector may order such natives or others as have cattle on the said farm to cleanse such cattle, and the Native Commissioner of the District in which such farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed between the said owner, occupier, or manager and the said native owners.

14. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable in respect of each offence to the fines and punishments prescribed by the Ordinance, and in cases where no special punishment is provided, to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for any period not exceeding three months, unless the penalty be sooner paid.

SCHEDULE.

(1) Fingo Location.

(2) An area within a radius of ten miles of Ntolas Kraal on the farm Emangeni.

(3) An area comprising the farms Upper and Lower Umvutcha, Reigate, Upper Nondwene, Mapane, Government Farm No. 5, Trenance and the plots adjoining the farms Umvutcha.

No. 216 of 1907.

Department of Agriculture,
Administrator's Office,
Salisbury, 10th October, 1907.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Subsection (*b*), Section 5 of Government Notice No. 188 of 1906, and declare the following to be of full force and effect in lieu thereof :—

Within the said area from private farms and trading stations to any centre of consumption, or to a railway station or siding, or to and from any other farm, or from a mine to a railway station or siding for the purpose of transporting fuel or mining timber, under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed ; provided that no permit shall be issued until the person applying for the same shall produce the written consent of the owners, occupiers, or managers of occupied lands proposed to

be traversed, and, in the case of native reserves, of the Native Commissioners, and that such cattle shall before being moved be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided further that, in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 217 of 1907.

Department of Agriculture,
Administrator's Office,
Salisbury, 10th October, 1907.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw as from the 1st October, 1907, the regulations promulgated by Government Notices No. 189 of 1906 and No. 185 of 1907, and declare that the following shall be of full force and effect in lieu thereof from that date within the province of Mashonaland and the fiscal division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be areas infected with a destructive disease:—

1. The movement of all cattle within the said area is prohibited save and except:—

(*a*) On permission granted by an officer specially authorised thereto by the Administrator.

(*b*) Within the boundaries of any single farm where such cattle are depastured.

(*c*) Within any area of land enclosed by a substantial fence.

(*d*) Within the boundaries of the various commonages, town lands, or grazing ground common to any mining camp.

(*e*) Within a radius of four miles of any native kraal situate within the boundaries of any native location or reserve, the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is further provided.

2. The movement of cattle for slaughter purposes shall be permitted under the written authority of an officer thereto duly authorised, subject to the following terms and conditions:—

(*a*) That such cattle are moved by the most suitable route to the centre of consumption. All cattle travelling by road to be under the personal supervision of a responsible white man, or native approved of by the Cattle Inspector.

(*b*) That before cattle may enter from a native district not included in any particular group of districts as defined in Section 6 (*b*) the written permission of owners, occupiers, or managers of all occupied land, and, in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass to the nearest station, siding, or centre of consumption is obtained; provided that in the event of such owners, occupiers, managers, or Native Commissioners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause.

(*c*) That such cattle shall, on arrival at the centre of consumption, subject to the terms of clause (*d*) hereof, be immediately taken to the prescribed quarantine area, and there be quarantined and confined, and branded with the letters "V.D." on the near side of the neck under the supervision of a duly authorised officer.

(*d*) That all cattle brought into any centre of consumption shall be disinfected by dipping or spraying at the public dipping station before being taken to the quarantine area.

(*e*) That all cattle admitted to the quarantine area shall be slaughtered within 21 days of their admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter. All such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and, if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

(*f*) That intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within less than a radius of five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of cattle required for *bona fide* mining, farming, breeding and dairying purposes and for private milk supplies may be permitted on the written authority of a duly authorised officer, subject to the following terms and conditions :—

(*a*) That such movement shall take place subject to the conditions set forth in Section 2 (*a*) and (*b*).

(*b*) That whenever such cattle shall at any place along the route have passed within a radius of less than five miles of an infected area, the cattle shall upon arrival at their destination be effectually isolated from all other cattle on the same land for a period of four weeks.

(*c*) That whenever the cattle being removed shall at any portion of the route have passed within native districts where infected areas exist, the consent in writing to such movement be obtained from all owners of cattle on farms adjoining that to which movement takes place ; and in the case of native reserves of the Native Commissioners of the districts ; provided that should such consent be unreasonably withheld by any of the aforesaid persons the Controller of Stock may direct the issue of a permit.

(*d*) That such cattle required for breeding and dairying purposes, or for private milk supplies, when moved to within the boundaries of the various commonages, town lands, or of grazing ground common to any mining camp or other centre where cases of African Coast Fever have occurred within 15 months, shall be confined in some enclosed place approved of by the local Cattle Inspector, and, if a case of African Coast Fever occur in such enclosure, shall not be liberated therefrom except in terms of Section 5 hereof, until 15 months after the last occurrence of African Coast Fever within the enclosure in which they are kept, nor shall they be allowed, after liberation, to run upon any of the land specified herein, unless such land has been free from African Coast Fever for a period of 15 months.

(*e*) All cattle introduced in terms of the preceding sub-section (*d*) shall, on arrival, be taken direct to the Government dipping station and there be dipped or sprayed.

(*f*) All cattle confined in terms of clause (*d*), and all calves born within the said enclosures, shall be sprayed every 14 days, as may be directed by the Cattle Inspector.

(*g*) No cattle shall be moved from one native district to another unless with the permission of the local Veterinary Officer and the Cattle Inspectors of the districts to and from which such movement takes place.

4. All calves having less than two permanent teeth running within the boundaries of the various commonages, town lands, or grazing ground common to any mining camp or other centres where cases of African Coast Fever have occurred within 15 months of the date of these Regulations, or born thereon after such date, shall be removed to some enclosed place approved of by the local Cattle Inspector, and shall not be liberated or allowed to run at large on such commonage, town lands or common grazing ground until 15 months after the occurrence of the last case of African Coast Fever within the enclosure in which they are confined, or upon such commonage, town lands or common grazing ground.

(*a*) No calves shall be permitted to accompany working cattle travelling along the roads mentioned in Section 7, sub-section (*c*), and all calves born of such working cattle whilst travelling shall not be removed from the place where born.

5. For the purpose of cleansing an area of disease the Controller of Stock may, under the authority of the Administrator and on the advice of the Chief Inspector of Cattle, subject to such conditions as may be stipulated, permit the removal of calves and other cattle to an adjacent clean area.

6. The movement of working cattle other than those specified in Section 7 hereof may be permitted within the following areas and on the terms and conditions hereinafter set forth :—

(*a*) Within a maximum radius of 15 miles of any working mine, or mine in course of development, for the purposes of such mine, provided that :—

(1) Such cattle shall only be moved under permission of a duly authorised Officer, and shall be dipped every 14 days where a dipping tank is available within such area, or, in the absence of a dipping tank, be thoroughly sprayed with an insecticide.

(2) Such permission shall not be granted where it conflicts with any other section of these regulations, or if such movement is considered to be dangerous to other cattle within the 15 mile radius.

(*b*) Within the boundaries of the Gwelo and Lomagundi Native Districts, and within and between the boundaries of the following adjoining Native Districts : (1) Salisbury, North and South Mazoe ; (2) Hartley, Charter and Chilimanzi ; (3) M'tokos, M'rewas, Marandellas and Makoni ; (4) Inyanga, Makoni and Umtali (as defined by Government Notice No. 13 of 1899) ; (5) Along the road West of the Sabi River from Odzi Bridge to Makondo Copper Mine, subject to the following conditions :

(1) That the movement will be permitted for such period as the Controller of Stock may in his discretion, and on the advice of the Chief Inspector of Cattle, deem expedient, provided that such permission may at any time be withheld or withdrawn without notice.

(2) That all applications for removal shall be approved of by the Cattle Inspectors of the districts through which the cattle pass.

(3) Provided that in the event of such Cattle Inspectors refusing to grant permits for the removal of cattle, the Chief Inspector may, on the advice of the local Veterinary Officer, direct the issue, if satisfied that the necessary permission is withheld without good and sufficient cause.

(4) That all such cattle are dipped every 14 days where a tank is available, or, in the absence of a tank, are thoroughly disinfected by spraying.

7. The movement of "salted" or immune working cattle shall be permitted on the following terms and conditions :—

(*a*) That such cattle have been registered and branded under the supervision of the Cattle Inspector with the brand "T.O." on near shoulder and the registration number on near horn, in terms of Section 7, clauses (*a*) and (*b*) of Government Notice No. 109 of 1905.

(*b*) That the movement of such cattle shall only take place under the written permit of a duly authorised officer and subject to the conditions that they are disinfected by dipping every 14 days, where a dipping tank is available, or, in the absence of a dipping tank, by thorough spraying with an insecticide.

(*c*) That movement of such cattle only shall be permitted :—

(1) Along the main roads of the Melsetter District.
(2) From Umtali to the Makondo Copper Fields.
(3) From Melsetter to Umtali.

8. In the event of failure of pasturage or water on land on which cattle are located the movement of such cattle will be permitted, provided :

(*a*) That such movement shall be to the nearest available pasturage by the most suitable route.

(*b*) That written consent be obtained in terms of Section 2, clause (*b*) hereof.

(*c*) That such movement shall be by permit only of a duly authorised officer and under the supervision of a responsible white man, or of a native approved of by the Cattle Inspector of the district.

9. All applications for the removal of cattle under Sections 2, 3 and 8 hereof shall be submitted to, and approved of by, the local Veterinary Officer before being granted.

10. All permits granted under the provisions of these Regulations shall specify the number and brands of cattle, route to be travelled and period allowed, and may define places of outspan, and all other conditions endorsed on such permits by the officer issuing the same shall be strictly observed.

11. All veldt-fed animals within the limits of the various commonages or town lands, or other centre where there is common grazing ground within the districts of Umtali and Melsetter and the scheduled area at Selukwe, upon which public dipping tanks have been established, shall be dipped therein at least once every 14 days ; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

12. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at a public dipping tank :—

For Horned Cattle (six months old and over) ..	3d. per head.
For Horses and Mules	3d. ,,
For Calves (under six months) and Donkeys ..	2d. ,,
For Small Stock	½d. ,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under the above tariff.

13. Any disinfecting by spraying required to be done under these regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed : provided that the Inspector may at his discretion carry out such disinfection with the assistance of and at the entire cost of the owner of the animals sprayed, the cost of such disinfecting being payable at the time of spraying.

14. Whenever the owner, occupier, or manager of a farm shall adopt means for cleansing his cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle Inspector may order such natives or others as have cattle on the same farm to cleanse such cattle or any others before permitting them to enter or pass over such an area, and the Native Commissioner of the district in which such farm is situated may enter into an arrangement with the native owners of cattle, to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

15. Any person contravening the provisions of these regulations shall be liable to the punishments prescribed by the Ordinance, and in cases where no special punishment is prescribed by the said Ordinance to a fine not exceeding £20, or to a period not exceeding three months' imprisonment with or without hard labour in default of payment of any fine inflicted.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 66 of 1907.

Department of Agriculture,
Administrator's Office,
Salisbury, 28th March, 1907.

AFRICAN COAST FEVER.

NOTWITHSTANDING anything to the contrary by regulation provided, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," hereby provide as follows:—

No cattle shall be allowed to be at large, or moved about for the purposes of work, or other cause, within the area defined hereunder, unless an Inspector shall be satisfied that the said cattle are immune from the disease known as African Coast Fever, and shall have caused such cattle to be branded with the letters "T O" on the near shoulder.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
Acting Treasurer.

AREA.

From a point on the Tebekwe River one and a half miles North East of the Wanderer Mine in a straight line to the Wanderer Dam, thence in a straight line to the Sebanga Poort, thence along the top of the Eastern slope of the Poort Hills to a point half a mile west of the Paf Mine, thence to the Lundi River in a straight line, thence in a straight line East to the Victoria Road Drift on the Tebekwe River, and thence up the River to the first named point, situate in the Native District of Selukwe.

No. 67 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 19th March, 1908.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by Section 5 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw that portion of Government Notice No. 94 of 1905 relating to an area set apart for the depasturing and quarantine of slaughter cattle at Selukwe, and declare the undermentioned area to be set apart in lieu thereof:—

A piece of fenced land in extent about 300 acres, situated on the farm Sebanga and adjacent to the Township of Selukwe.

W. H. MILTON, Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON, Treasurer.

No. 114 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 16th April, 1908.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw section 9 of Government Notice No. 217 of 1907, and declare the following to be of full force and effect in lieu thereof :—

Notwithstanding anything to the contrary elsewhere provided, all applications for the removal of cattle under sections 2, 6 and 8 of the Regulations published under Government Notice No. 217 of 1907 shall be submitted to, and approved of, by the local Government Veterinary Surgeon or Cattle Inspector before being granted, except in the native districts of Lomagundi, North and South Mazoe, Mrewas, Marondellas, Makoni, Inyanga, Salisbury, Hartley, Charter, and Chilimanzi, within which districts officers duly authorised to issue permits may authorise such removal without submitting the aforesaid applications to, and obtaining the approval of, the local Veterinary Officer.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer

Provisions extended to Native District of M'danga by Government Notice No. 170 of 1908.

No. 207 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 16th July, 1908.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 40 of 1908, and amend Government Notice No. 217 of the 10th October, 1907, by extending the provisions of section 6 thereof to the movement of working cattle in the native district of Ndanga and that portion of the Victoria native district lying east of the Popotekwe River and north of the Ndanga road, provided, however, that such movement shall only take place as between occupied farms and for purposes connected with employment at the Umkondo Mine.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 123 of 1908.

Administrator's Office,
Salisbury, 23rd April, 1908.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows :—

1. For the purposes of the more effectual control and supervision of cattle in any infected area the Controller of Stock may direct the branding of any such cattle with a special brand by him selected.

2. Any person who shall refuse or neglect to afford all reasonable facilities for branding cattle as aforesaid shall be liable to a fine not exceeding twenty pounds, and in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

W. H. Milton,
Administrator.

By command of His Honour the Administrator in Council,
F. J. Newton,
Treasurer.

No. 110 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof :—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions :—

(1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions :—

(1) Importation shall be through and direct from the coast ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

GOVERNMENT NOTICE NO. 110 OF 1908, SECTION 1 (2).

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
.....
4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date .....

Application .....

Permit No. .....

ANNEXURE "B."

I,.....residing on the farm .....
in.....do solemnly and sincerely declare that the animals enumerated below have been in my possession since birth, and that lung-sickness, pleuro-pneumonia or any other contagious or infectious disease has not existed amongst any of my cattle or on my farm within the last four years, and that to the best of my knowledge and belief such cattle in travelling to.....* station will not come in contact with any animals amongst which lungsickness or any other contagious or infectious disease has existed during that period.

And I make this solemn declaration conscientiously believing the same to be true.

.....

Declared to at..... on this.....day of.....before me....., Resident Magistrate for the District of .....

Number of Animals.....Bulls.....Heifers.....

Breed.....

Seller's Name and Address.....

Purchaser's Name.....

Place in Southern Rhodesia to which animals are being sent.....

* Station within the Colony of origin.

No. 124 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 30th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that notwithstanding anything to the contrary elsewhere provided, the importation of cattle for *bona-fide* slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese Territory under the following terms and conditions :—

1. The importation and disposal of cattle introduced in terms of these regulations shall be under the absolute control and direction of the local veterinary surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
2. The importation shall be limited to a fenced enclosure approved of by the Controller of Stock, which shall be situated on the Rhodesian side of the Anglo-Portuguese frontier line where it passes through the farm "Birkley."
3. Cattle introduced as aforesaid shall be immediately slaughtered, and no meat thereof shall be removed without special permission unless it is entirely free from skin and ears.
4. The hides of animals slaughtered in the said enclosures shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a veterinary surgeon that they have been satisfactorily disinfected and dried.
5. Any person contravening the provisions of these regulations, or the instructions or directions of the local veterinary surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 152 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 21st May, 1908.

IMPORTATION OF CATTLE FROM NORTH-EASTERN AND NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel sections 4, 5, and 6 of Government Notice No. 187 of 1906, and declare the following to be in force in lieu thereof :

1. Cattle may be imported from North-Eastern Rhodesia, provided that :—
   (*a*) The permission of the Chief Inspector of Cattle be first had and obtained.
   (*b*) All cattle be introduced by way of the port or town of Feira, which is hereby declared a Port of Entry for cattle, and taken to Sipolilo.
   (*c*) All cattle shall remain in quarantine at Sipolilo for a period of six weeks from date of arrival.

2. Slaughter cattle may be imported from North-Western Rhodesia, provided that :—

(*a*) The permission of the Chief Inspector of Cattle or of a Government Veterinary Surgeon be first had and obtained.

(*b*) All such cattle shall be conveyed by rail *via* the Victoria Falls, which is hereby declared a Port of Entry for cattle, and be carried to the station or siding nearest to the centre of consumption.

(*c*) On arrival at their destination such cattle shall be subject to the regulations controlling the movement and disposal of slaughter cattle.

3. Cattle for general purposes may be imported from North-Western Rhodesia, provided that :—

(*a*) Such importations shall take place between the 1st April and the 30th September in each year.

(*b*) The permission of the Chief Inspector be first had and obtained.

(*c*) All cattle imported shall be introduced by rail only and *via* the Victoria Falls, and shall be branded before entry with the letters "N.Z." on the near shoulder.

(*d*) All cattle shall on entry be taken to a prescribed area to the north of the Gwaai River, where they shall remain in quarantine for a period of six weeks from the date of their arrival.

(*e*) No cattle shall be removed from the quarantine area until examined by a Government Veterinary Surgeon.

(*f*) All cattle removed from the quarantine area as aforesaid shall be taken direct to their destination and shall not be moved therefrom for a period of twelve months from the date of arrival thereat.

4. Every application for permission to introduce cattle under sections 1 and 3 shall be accompanied by a certificate in the form of Annexure "A" attached to this Notice.

5. Any person found introducing cattle from North-Eastern or North-Western Rhodesia otherwise than in accordance with these regulations or submitting any certificate false in any material particular or refusing or neglecting to submit cattle introduced to proper inspections and tests, or failing to quarantine properly such cattle when introduced, shall be liable to a fine not exceeding £10 for every animal in connection with which the offence complained of is committed, and in default of payment of any fine inflicted to imprisonment with or without hard labour for any period not exceeding three months, and the cattle in regard to which the complaint has been laid and proved may, under the written direction of the Administrator, be destroyed without compensation.

W. H. Milton,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. Fynn,
For Treasurer.

ANNEXURE "A."

I,....., residing on the farm..... in the district of.....in the Territory of North-Eastern or North-Western Rhodesia (as the case may be), do solemnly and sincerely declare that the animals enumerated below have been in my possession for twelve months, or that I purchased them from..... ....., residing in the district of ....., in the Territory of North-Eastern or North-Western Rhodesia, on the day of.....(as the facts permit), and that no case of lung-sickness or other contagious disease has existed amongst any of my cattle or on my farm or other cattle with which they have been in contact within the last two years, and that, to the best of my knowledge and belief, such cattle, in travelling to Feira (or Victoria Falls), will not come in contact with any animals amongst which lung sickness or other contagious disease has existed during that period.

No. 244 of 1908.

Administrator's Office,
Salisbury, 20th August, 1908.

THE subjoined Proclamation by the Governor of German South-West Africa, prohibiting the importation into that territory of large cattle and grass-hay from Rhodesia, the Bechuanaland Protectorate and Angola, is hereby published for general information.

By command of His Honour the Administrator.

H. MARSHALL HOLE,
Secretary, Department of Administrator.

PROCLAMATION.

Proclamation of the Imperial Governor of German South-West Africa concerning the prohibition of the importation of cattle, etc., from Rhodesia, the British Bechuanaland Protectorate and Angola, dated the 23rd of June, 1908.

Acting on the authority of section 15 of the law relating to Protectorates, etc. (*Imperial Law Gazette*, 1900, p. 13), and section 5 of the regulations issued by the Imperial Chancellor concerning the powers of the authorities of the Protectorates in Africa and the South Sea and their right to issue orders by Proclamation referring to naval and consular matters, dated the 27th September, 1903 (*Colonial Gazette*, p. 509),

It is herewith proclaimed and ordered for the South-West African Protectorate as follows :—

Section 1.—The importation of large cattle of every kind—namely, bulls, oxen, cows, heifers and calves—as well as of horns, hoofs and skins thereof, and further, the importation of grass-hay from Rhodesia, the British Bechuanaland Protectorate and Angola is prohibited.

Section 2.—Whoever contravenes this order shall be punishable by a fine not exceeding 10,000 M., or by imprisonment not exceeding three months, or by a fine and imprisonment combined. The objects or articles concerned in the contravention of this Proclamation shall be subject to confiscation.

Section 3.—This Proclamation is in force from the date of its publication.

The Imperial Governor,

(Sgd.) VON SCHUCKMANN.

Windhuk, 23rd June, 1908.

No. 248 of 1908.

Department of Agriculture,
Salisbury, 27th August, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby authorise the importation from the United States of America of cattle required for *bona-fide* breeding purposes, provided, however, that such importation shall be subject to the provisions of Government Notice No. 110 of the 16th April, 1908, relating to the importation of cattle from the United Kingdom of Great Britain and Ireland.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 268 of 1907.

Department of Agriculture,
The Treasury,
Salisbury, 26th December, 1907.

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows :—

1. The assembly of cattle for purposes of sale by auction or otherwise may be permitted at such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20 or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 42 of 1907.

Department of Agriculture,
Administrator's Office,
Salisbury, 28th February, 1907.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, on and after the 15th day of March, 1907, all and singular the Government Notices regarding the disease of Rabies now subsisting and in force in this Territory are hereby cancelled and repealed, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and in lieu thereof the following regulations shall have full force and effect :—

1. All and several the various Native Districts of Southern Rhodesia are hereby declared to be areas infected with the disease of Rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the 1st day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date shall register such dog with an official appointed for the purpose, provided that this provision shall not apply to any Municipality, Township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge must be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of the badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Every dog shall be kept muzzled with a standard wire muzzle made according to the pattern lodged with each Magistrate and Assistant Magistrate, and open to inspection on application to him, or with a muzzle sufficient to prevent its biting or injuring any person or other animal with its teeth, or shall be secured in an enclosure or by chain in such a manner that it shall not have access to persons or animals nor other animals access to it.

8 Every dog found at large after the 15th day of March, 1907, not being sufficiently muzzled, may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter prescribed.

9. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon or other official vested with the performance of functions under the Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal either in the hands of the owner or at some other suitable place.

10. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these regulations, who shall immediately report same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observation.

11. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

12. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest Veterinary Official.

13. Any person contravening any of the above regulations or failing to carry out any of the provisions thereof shall be liable on conviction to a fine not exceeding £10 for each offence or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

———

No. 156 of 1907.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that on and after 15th August, 1907, Sections 7 and 8 of Government Notice No. 42 of 1907 are repealed and the following new Sections substituted:—

7. Every dog shall be kept muzzled with a standard wire muzzle made according to the patterns lodged with each Magistrate and Assistant Magistrate, and open to inspection on application to him, or shall be secured in an enclosure or by chain in such a manner that it shall not have access to persons or animals nor other animals access to it.

8. Every dog found at large after the 15th day of August, 1907, not being muzzled with a standard wire muzzle may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty prescribed in the aforesaid Government Notice.

No. 228 of 1907.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that on and after the 1st November, 1907, the following regulation shall have full force and effect in addition and supplementary to the Regulations proclaimed by me under Government Notice No. 42 of 28th February, 1907.

14. Notwithstanding the provisions of Section 7, the following classes of dogs shall be allowed to go unmuzzled subject to the conditions respectively set forth in each class.

a. Pointers, Setters, Spaniels, and all such sporting dogs, when being *bona fide* used and at work before the gun, and under the ordinary supervision and control of persons in charge of them, carrying guns for the shooting of game.

b. Packs of Foxhounds, Harriers or Beagles, duly registered as such before the Resident Magistrate of the District in which their owner or owners reside, when under the ordinary supervision and control of not less than two persons engaged in the chase.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

No. 129 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 7th May, 1908.

RABIES.

WHEREAS it has been shown to me that it is expedient to take measures to prevent the spread of rabies in the undermentioned district, Now Therefore, under and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby authorise and direct that all dogs at the kraals fo the natives Chiduku and Maveja, and all dogs within a radius of ten miles of such kraals in the native district of Makoni, shall be destroyed by shooting, poisoning or other approved methods, and that the carcases of all dogs shall be burnt or buried at a depth of not less than three feet below the surface.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 178 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 18th June, 1908.

RABIES.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I hereby declare and make known that the provisions of Government Notice No. 42 of 1907, relating to the muzzling of dogs shall not apply to the following areas :—

The Towns and Commonages of Salisbury, Bulawayo, Umtali, Gwelo, Victoria, Selukwe, Gwanda, Hartley, Enkeldoorn and Melsetter.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 215 of 1908.

Department of Agriculture,
Administrator's Office,
Salisury, 23rd July, 1908.

RABIES.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the provisions of Government Notice No. 178 of 1908 in so far as they relate to the town and commonage of Gwelo, and declare that the provisions of Government Notice No. 42 of 1907 regarding the muzzling of dogs shall apply to the said town and commonage.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 133 of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 7th May, 1908.

IMPORTATION OF PLANTS, ETC., REGULATIONS.

UNDER and by virtue of the powers in me vested by the "Importation of Pants Regulation Ordinance, 1904," I do hereby cancel Government Notice No. 211 of 1907 and declare the following to be of full force and effect in lieu thereof :—

1. Until further notice no person shall introduce into this Colony any grape vine, Virginia creeper, or other plant of the family *vitacæa* or any fruit or other portion thereof, from any of the following districts of Cape Colony :—

Aberdeen	Albany.	Alexandra.
Bathurst	Bedford.	Cradock.
Cathcart.	East London.	Fort Beaufort.
Graaff-Reinet.	Glen Grey.	Humansdorp.
Jansenville.	King William's Town.	Port Elizabeth.
Komgha.	Middelburg.	Somerset East.
Peddie.	Queenstown.	Tarka.
Stockenstroom.	Stutterheim.	
Uitenhage.	Victoria East.	

This regulation shall not, however, apply to grape jam, wine, brandy, vinegar or must.

2. If at any time an inspector shall find any grape vine, Virginia creeper or other plant of the family *vitacæa*, or any fruit or other portion thereof introduced into this territory in contravention of this regulation, he shall order the same to be immediately removed from the territory, or the Secretary for Agriculture may order the same to be destroyed without delay.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 197 of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 2nd July, 1908.

IMPORTATION OF PLANTS, ETC., REGULATIONS.

UNDER and by virtue of the powers in me vested by the "Importation of Plants Regulation Ordinance, 1904," I do hereby provide that the Regulations published under Government Notice No. 133 of the 7th May, 1908, shall not apply to the importation of raisins.

W. H. MILTON,

Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,

Treasurer.

No. 221 of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 30th July, 1908.

IMPORTATION OF PLANTS, ETC., REGULATIONS.

UNDER and by virtue of the powers in me vested by the "Importation of Plants Regulations Ordinance, 1904," I do hereby cancel and withdraw the prohibition contained in Government Notice No. 236 of the 21st November last against the importation of any tree, shrub or vegetable and the fruit, leaves, cuttings, bark or any part thereof from the Orange River Colony.

W. H. MILTON,

Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,

Treasurer.

No. 249 of 1908.

The Treasury,

Salisbury, 27th August, 1908.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

W. H. MILTON,

Administrator.

By command of His Honour the Administrator,

F. J. NEWTON,

Treasurer.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows :—

(*a*) Birds and Small Buck.

(*b*) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.

(*c*) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Open Areas.—All game in Classes "B" and "C," excepting Ostrich, Elephant, Hippopotamus and Rhinoceros, may be destroyed at any time in certain defined portions of the Hartley and Lomagundi Districts, and also within a radius of twenty miles of the Native Commissioner's Office in the Sebungwe District, without payment of any licence fee. The areas will be found more fully described in Government Notices Nos. 237 of 1906, 82 and 143 of 1907. The destruction of game in these localities was rendered necessary through the spread of Tsetse Fly.

Elephants when found on occupied farms on the High Veld in the Melsetter District may be destroyed, *vide* Government Notice No. of 1908.

Game in Class "A" may be hunted in the close season ending 30th April, 1909, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonages or Townlands of Salisbury, Bulawayo, Umtali and Melsetter ; within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"*Locust Birds*" are strictly protected, *vide* Government Notice No. 121 of 1907.

No. 9 of 1907.

NORTH-WESTERN RHODESIA.

WHEREAS there is reason to believe that certain diseases in cattle exist in the Territory of Southern Rhodesia, the Bechuanaland Protectorate, German West Africa, Portuguese West Africa, and Portuguese East Africa, and it is therefore expedient to take measures to prevent the spread of such diseases to North-Western Rhodesia.

Now, therefore, under and by virtue of the powers in me vested by Section 2 of His Excellency the High Commissioner's Proclamation, No. 18 of 1906, bearing date the 31st day of July, 1906, I do hereby order and declare and make known as follows :—

1. That Government Notices, No. 2 of 1902, and No. 11 of 1906, are hereby withdrawn, and the following Regulations substituted :

2. The introduction of any bull, ox, cow, heifer or calf or the meat of any such animals, into the Territory of North-Western Rhodesia from the Territories of Southern Rhodesia, the Bechuanaland Protectorate, German West Africa, Portuguese West Africa, and Portuguese East Africa, is prohibited until further notice.

3. No person shall introduce into the Territory of North-Western Rhodesia from the Territories aforesaid, any horse, mare, gelding, mule, donkey, sheep, goat or pig, horns or skins, or any kind of vehicle, wagon gear, trek gear, or harness, without having first obtained the special permission in writing of a District Commissioner, Civil Commissioner, or other person thereto authorized by me ; and such animals, horses, skins, vehicles, gear, or harness, shall enter the Territory of North-Western Rhodesia at such place, and under such conditions as regards quarantine and disinfection, as shall be ordered by the person issuing such written permission as is above described.

4. Whenever any conditions as to quarantine, isolation, disinfection or otherwise, are imposed, such conditions shall be fulfilled at the sole risk and expense of the owner, consignee, or other person concerned.

5. All live stock imported into the Territory by rail by way of Victoria Falls and Livingstone, shall be inspected at Livingstone Station, and, whenever disinfection is ordered, shall be disinfected at that Station.

6. In the case of live stock consigned to any point on the railway line north of Livingstone Station, the officer authorized to issue the written permission aforesaid shall further order the disinfection of the truck or horse-box in which such stock is being conveyed. Such disinfection shall be carried out at the expense of the owner or consignee of the stock, or other person concerned therein.

7. Consignors and importers of live stock shall give not less than seven days' notice of the arrival of such stock at Livingstone Station. Such notice shall be given to the Civil Commissioner, Livingstone, or to such other official as may hereafter be appointed.

ROBERT CODRINGTON,

Administrator.

By command of His Honour the Administrator,

HENRY RANGELEY,

Acting Secretary.

Administrator's Office,
Livingstone, North-Western Rhodesia,
30th September, 1907.

Departmental Notices.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the Notice issued by this Department, dated 8th June, 1906, offering certain rewards for the destruction of wild carnivora, etc., will, *after 31st March, 1908*, cease and determine, and thereafter rewards will be paid only on the scale and conditions herein set forth.

2. Rewards will be paid as follows:—

		£		
For each	Lion	3	0	0
,,	Leopard	1	0	0
,,	Cheetah	1	0	0
,,	Wild Dog	0	10	0
,,	Crocodile, of not less than 3 ft. in length ...	0	10	0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a declaration made in the form of the annexure hereto.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

E. ROSS TOWNSEND,
Secretary for Agriculture.

FARM APPRENTICES.

The Secretary for Agriculture would be glad to receive the names of farmers willing to take students from oversea for instruction in South African farming.

He also wishes to make it known that a large number of young Colonials with experience are anxious to obtain situations on farms in Rhodesia. Farmers are now invited to state on what terms they would offer to take these —sending in the full particulars to this Department as early as possible.

STRYCHNINE.

Stockowners can obtain a limited quantity of strychnine for the destruction of carnivora at a cost of 4s. 6d. per ounce.

GOVERNMENT STALLIONS FOR PUBLIC STUD.

The stallion "Dolfos" is stationed at Bulawayo, where applications, giving full particulars of mares to be served, should be addressed to the Government Veterinary Officer, Bulawayo.

The stallion "Robber Knight" is stationed at Enkeldoorn until November, where arrangements for service of mares are to be made with the C.O., B.S.A. Police, Enkeldoorn. The stallion will then return to Salisbury, where he will remain at stud until further notice.

The owners of mares brought to stud will have to make all necessary arrangements for attendance, stabling and feeding of their animals, as the Department can take no responsibility whatever.

Pedigree.—"Robber Knight" by "Sir Hugo," ex "Fritters" by "St. Simon."

VAPORITE.

The new preparation, "Vaporite," suitable for the destruction of cut-worms, wire-worms, white ants, and other soil-infesting pests, can be obtained from the Department in quantities of not less than 2 cwt. at 17s. 6d. per cwt. Application to be accompanied by remittance covering cost and transport charges.

TOBACCO SEED.

The following varieties of tobacco seed may now be obtained by planters from this Department at the prices named, which include postage. Orders must be accompanied by remittance.

	per oz. s.	d.
Turkish, Yenedje, Xanthi, Aya Solouk	1	6
Turkish, Cavalla	1	6
Goldfinder (a bright Virginia leaf, when flue-cured, brighter than Hester)	1	2
Hester (a bright Virginia, suitable for sandy soils)	1	0

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo African Trading Company at Salisbury, Bulawayo, and Gwelo. Price 2½d. per square yard.

CULTURE OF TOBACCO.

This book, by G. M. Odlum, containing the History of the Tobacco Plant from seed to manufacture, can be obtained from this Department. Price 2s., post free 2s. 4d.

PRIZE COMPETITION FOR RHODESIAN GROWN TOBACCO LEAF.

The following prizes are offered by the British South Africa Company to be awarded for the best crops of tobacco leaf grown during the season 1907-8.

1. For Rhodesian grown leaf from Turkish seed.

(*a*) Best crop weighing between one thousand and five thousand pounds: £25

(*b*) Best crop weighing five thousand pounds and over: £75.

2. For Rhodesian grown leaf from American seed and flue cured.

(*a*) Best crop weighing between one thousand and five thousand pounds: £25.

(*b*) Best crop weighing five thousand pounds and over: £75.

Conditions of Competition.

1. All competing crops must be cured, dried, packed in bales and delivered for sale at one of the Company's warehouses in Rhodesia.

2. Picked or selected exhibits representing but a portion of a crop cannot enter for competition.

3. Any or all competing crops may be disqualified by the Judges, if in their opinion they are not properly packed or in keeping condition.

4. Two Judges, both expert tobacco leaf men, will be appointed, one to be nominated by the British South Africa Company, and the other by the Rhodesian Agricultural Union. If necessary, an Umpire may be nominated by the Judges.

5. No competitor shall enter for both prizes in the same class.

6. All competing crops shall be the product of the season in which they are entered for competition.

7. Crops can be lodged at one of the Company's warehouses at Salisbury or Bulawayo any time during the season up to the end of December, but notice of intention to enter for competition should be sent to the Agricultural Department at as early a date as possible, and not later than 31st August.

IMPORTED MAIZE SEED.

During his visit to America, Mr. Odlum made a selection of a quantity of pedigree maize seed for the Rhodesian Government. The varieties are Boone County and Gold Standard Leman.

This seed may now be obtained from the Agricultural Department at $3\frac{1}{2}$d. per lb. free on rail at Salisbury; remittance to accompany order.

INSTRUCTIONS FOR TAKING SAMPLES OF SOIL FOR ANALYSIS.

In taking samples of soil for analysis, it is important that they should be of a truly representative character; and, when sending them in to the Department, it should be stated for what purpose it is intended to use the land, whether for cereals, tobacco, lucerne, fruit-growing, etc. If much difference exists in the area to which the analysis is intended to refer, a separate sample of each of the different soils should be forwarded.

Samples should be taken as follows:—

Dig several holes 3 feet deep, the number varying according to the size of the land, care being taken to avoid tree roots, and hills, or any spots marked by rank vegetation or the absence of vegetation. Select the hole showing the most representative character, and from the side of it cut a section with a knife or trowel, about 2 inches square and 10 inches deep, first clearing off the top vegetation. Place this section in a bag by itself (No. 1), then take another section below the first, about 14 inches deep, and put in a separate bag (No. 2); below the second section take a third, about 12 inches deep, and place in a third bag (No. 3). If rock is encountered before this section can be cut, send a sample of the rock, about 1 lb. weight.

When the sample is of cultivated land, the top section should be taken from each of the holes made and thoroughly mixed, and about 4 lbs. of the mixture sent for analysis; 2 or 3 lbs. each of the other sections, taken at the depths mentioned above, from one hole only, is sufficient. When forwarding the samples, as much information as possible should accompany them; such as, whether the situation is near a river, if from sloping or level ground, the behaviour of the land under much rain or severe drought, if it yields good crops or poor, if kraal or other manures have been applied recently and in what quantities.

Samples should be addressed to: The Secretary for Agriculture, Agricultural Department, Salisbury, and accompanied in all cases with full particulars as set forth above. No attention will be paid to samples sent without full details.

Schedule of Charges made for Analysis in the Agricultural Laboratory, Salisbury.

	£	s.	d.
1. Estimation of two or three constituents in mineral or other manures	0	15	0
2. Analysis of water for stock or irrigation purposes	1	0	0

	£	s.	d.
3. Estimation of Lime or Phosphoric Acid in rock specimens	0	15	0
4. Partial analysis of soil—Mechanical analysis and determination of one or two constituents	2	0	0
5. Complete analysis of soil	3	0	0

At present no charge will be made to *bona fide* farmers. The charges in the above schedule are for products sent in by merchants, dealers, and others interested in trade. The Analyst will exercise his discretion as to the examination of all samples, whether they are of sufficient importance for determination.

The right of publishing the result of any analysis is reserved by the Department.

EXPORT OF SOUTH AFRICAN HAY TO GREAT BRITAIN.

The following wire has been received by His Honour the Administrator from His Excellency the High Commissioner relating to the export of hay from South Africa:

"Johannesburg, April 27th, 1908.

"I have received notification from the Secretary of State for the Colonies that, owing to risk of spread to farm stock in Great Britain of disease known as African Coast Fever through the medium of hay from South Africa, Board of Agriculture are taking steps under Diseases of Animals' Acts, 1894 to 1903, to prevent its importation unless and until they are satisfied that disease has been eradicated from South Africa.

"You should accordingly warn intending shippers that His Majesty's Government will probably take steps to prevent such hay being landed in Great Britain. The Board of Agriculture notifies that its interpretation of the term 'Hay' includes all dried fodder plants that have not had their seeds removed, and that term as used in this correspondence is intended to cover oat hay, vetch hay, lucerne hay (Alfalfa), as well as ordinary grass and clover hay."

Editorial Notices.

Original subscribers to the *Journal*, who have complete sets of the earlier numbers to dispose of, are requested to communicate with this office, as numerous enquiries for the first and second volumes, now out of print, have been received.

Subscriptions to the *Journal* (5s.), issued bi-monthly, should be addressed to the paymaster, Agricultural Department, Salisbury. Only communications relating to the literary department should be addressed to the Editor, and if an answer is required in the pages of the *Journal*, should reach this office not later than the 15th of the month preceding publication. Charges for the insertion of advertisements will be forwarded upon application to the paymaster. Subscribers are requested to notify immediately the non-delivery of the *Journal*.

Farmers requiring latest market prices for produce and live stock at Kimberley, Johannesburg, Bulawayo, Gwelo, Salisbury, Umtali, and Beira, can obtain same from this office by next mail or prepaid wire.

Advertisements will be accepted from *bona fide* farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every ten words.

Applications for Advertisement Rates to be made to J. Kapnek, Sole Advertisement Contractor for "Rhodesian Agricultural Journal," P.O. Box 91, Salisbury and Box 45 Bulawayo.

Farmer's Advertisements.

PERSIAN Ram Lambs for sale, from pure bred stock imported from Cape Colony. Apply H. E. Light, c/o. Meikle Bros., Salisbury.

BREEDER of Dairy Cattle has on hand Young Bull Calves from Cape Cows (Friesland), £10 each, taken at 8 months.—C. C. Macarthur, Box 284, Salisbury.

FARM AND GARDEN SEEDS.

Imported Scotch and English Seed Potatoes.
Provence Lucerne (dodder free). Rape. Tares.
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Breaking and Training Horses—By Barton, M.R.C.V.S.
Veterinary Notes for Horse Owners—By Capt. Hayes.
The Horsewoman—By Mrs. Hayes.
Armatage's "Cattle Doctor."
Complete Modern Farrier—By Brown.
Horticulture—By Smith Bros.
A Modern Bee Farm—By Simmins.
Citrus Fruits and their Culture—By Hume.
Stock Owner's Guide—By Heatley.
The Groom's Guide—By Barton.
Mayhew's Horse Management.
Forage Corps—By Shaw.
Soils and Crops of the Farm—By Morrow and Hunt.
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Successful Fruit Culture—By Maynard.

—LETTS' DIARIES FOR 1908.—

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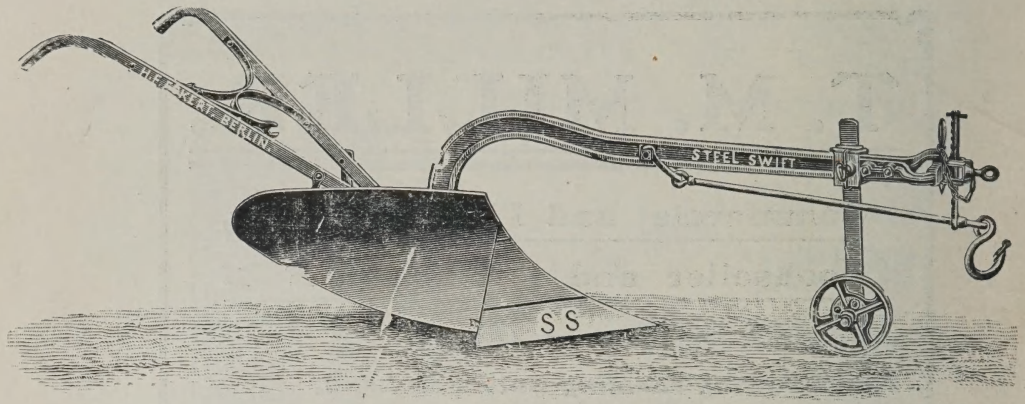

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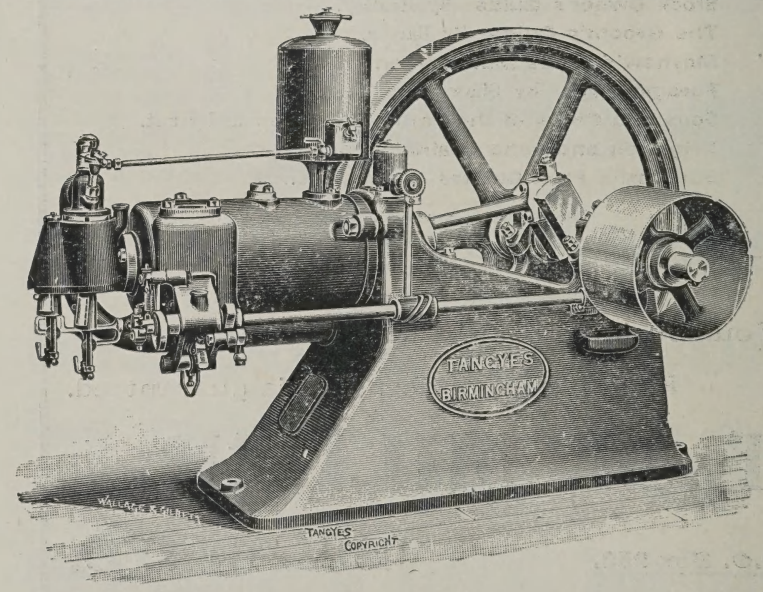

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Total ,, ,,	...	53 ,,
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